

TM 5-3805-240-12

DEPARTMENT OF THE ARMY TECHNICAL MANUAL

**OPERATOR AND ORGANIZATIONAL
MAINTENANCE MANUAL**

**DITCHING MACHINE: DIESEL ENGINE DRIVEN;
WHEEL MOUNTED; LADDER TYPE; 6 FT
DEPTH OF CUT, 24 INCH WIDTH
OF CUT (PARSONS MDL 624VL)
FSN 3805-050-4638**

This reprint includes all changes in
effect at the time of publication -
Change 6.

HEADQUARTERS, DEPARTMENT OF THE ARMY

JUNE 1969

CHANGE }
No. 6 }

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, DC, 29 May 1980

**Operator and Organizational
Maintenance Manual
DITCHING MACHINE: DIESEL ENGINE DRIVEN; WHEEL
MOUNTED; LADDER TYPE; 6 FT DEPTH OF CUT, 24 INCH
WIDTH OF CUT (PARSONS MDL 624VL)
NSN 3805-00-050-4638**

TM 5-3805-240-12, 2 June 1969, is changed as follows:

Cover. Inside the front cover add the following:

WARNING

Stay off fenders during digging operation.
Fender surfaces are for maintenance work area only.

**WARNING
RADIATION HAZARD**

This equipment contains the following *radioactive* item:

TACHOMETER, located on Control Panel.
Instructions for safe handling, maintenance, storage, and disposal of this item are contained in TB 750-248.

Page 1-1. Paragraph 1-1*d* is added as follows:

d. Reporting Errors and Recommending Improvements.
You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter or DA 2028 (Recommended Changes to Publications and Blank Forms) direct to: Commander, US Army Tank-Automotive Materiel Readiness Command, ATTN: DRSTAMPB, Warren, MI 48090. A reply will be furnished to you.

Paragraph 1-1*e* is deleted.

Paragraph 1-2 is superseded as follows:

1-2. Forms and Records

Maintenance forms, records, and reports which are to be used by maintenance personnel at all maintenance levels are listed in and described by TM 38-750.

Section III. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES

3-5. General

Preventive maintenance is detecting/correcting problems before they happen, or fixing little problems before they become big problems. Table 3-01 contains a list of preventive maintenance checks and services to be performed

Page 1-5, paragraph 1-4*b*(24), Nut and bolt torque data.
Add the following line:

Headshaft sprocket bolts..... 130 ft-lb.

Page 2-7. Paragraph 2-3*b* add the following:

(6) Refer to figure 3-117 and adjust the shift lever and linkage assembly.

Paragraph 2-6*b* add the following:

For traveling at road speeds or transporting, the boom must be placed in travel configuration and the lock pins installed to prevent damage to the hydraulic cylinder piston rods.

Page 2-11. Paragraph 2-13*a*(1) add the following:

During operations provide for inspection, every 2 to 4 hours, of buckets and bucket bosses for unusual wear and measurement of trench width. A finished trench width, at half depth or near bottom, of 22½ inches or less is an indication that the limit of clearance teeth wear has been reached and reversal or replacement is necessary.

Paragraph 2-13*b*(2) add the following:

CAUTION

The boom must be placed in travel configuration and lock pins installed for traveling at road speeds.

Paragraph 2-13*d*, immediately after the paragraph title, add the following:

WARNING

Stay off fenders during digging operation.
Fender surfaces are for maintenance work area only.

Page 3-1, section III is superseded as follows:

by operator/crew. Attention to these checks and services will increase the useful life of the ditching machine, but every possible problem cannot be covered in the PMCS. You need to be alert for anything that might cause a problem.

* This change supersedes C 1, 5 March 1970; C 3, 18 November 1971; C 4, 11 July 1972; and C 5, 20 July 1973.

3-6. Maintenance Forms and Records

Every mission begins and ends with the paperwork. There isn't much of it, but you have to keep it up. The forms and records you fill out have several uses. They are a permanent record of the services, repairs, and modifications made on your equipment. They are reports to organizational maintenance and to your commander. And they are a checklist for you when you want to know what is wrong with the equipment after its last use, and whether those faults have been fixed. For the information you need on forms and records, see TM 38-750.

3-7. Preventive Maintenance Checks and Services

a. Do your (B) PREVENTIVE MAINTENANCE just before you operate the equipment. Pay attention to the CAUTIONS and WARNINGS.

b. Do your (D) PREVENTIVE MAINTENANCE during operation. (During operation means to monitor the ditching machine and its components such as the radiator while they are actually being operated).

c. Do your (A) PREVENTIVE MAINTENANCE right after operating the equipment. Pay attention to the CAUTIONS and WARNINGS.

d. Do your (W) PREVENTIVE MAINTENANCE weekly.

e. Do your (M) PREVENTIVE MAINTENANCE once a month.

f. If something doesn't work, troubleshoot it with the instructions in this manual or notify your supervisor.

g. Always do your PREVENTIVE MAINTENANCE in the same order, so it gets to be a habit. Once you've had some practice, you'll spot anything wrong in a hurry.

h. If anything looks wrong and you can't fix it, write it on your DA Form 2404. If you find something seriously wrong, report it to organizational maintenance RIGHT NOW.

i. When you do your PREVENTIVE MAINTENANCE, take along the tools you need to make all the checks. You always need a rag or two.

WARNING

Drycleaning solvent, used to clean parts, is potentially dangerous to personnel and property. Do not use near open flame or excessive heat. Flash point of solvent is 138°F.

(1) *Keep it clean.* Dirt, grease, oil, and debris only get in the way and may cover up a serious problem. Clean as you work and as needed. Use drycleaning solvent (SD-2) to clean metal surfaces. Use soap and water when you clean rubber or plastic material.

(2) *Bolts, nuts, and screws.* Check them all for ob-

vious looseness, missing, bent, or broken condition. You can't try them all with a tool, of course. But look for chipped paint, bare metal, or rust around bolt heads. If you find one you think is loose, tighten it or report it to organizational maintenance.

(3) *Welds.* Look for loose or chipped paint, rust, or gaps where parts are welded together. If you find a bad weld, report it to organizational maintenance.

(4) *Electric wires and connectors.* Look for cracked or broken insulation, bare wires, and loose or broken connectors. Tighten loose connectors and make sure the wires are in good shape.

(5) *Hoses and fluid lines.* Look for wear, damage, and leaks, and make sure clamps and fittings are tight. Wet spots show leaks, of course. But a stain around a fitting or connector can mean a leak. If a leak comes from a loose fitting or connector, tighten it. If something is broken or worn out, report it to organizational maintenance.

j. It is necessary for you to know how fluid leakage affects the status of your equipment. The following are definitions of the types/classes of leakage you need to know to be able to determine the status of your equipment. Learn, then be familiar with them and REMEMBER—WHEN IN DOUBT, NOTIFY YOUR SUPERVISOR!

Leakage definitions for Operator/Crew PMCS

CLASS I Seepage of fluid (as indicated by wetness or discoloration) not great enough to form drops.

CLASS II Leakage of fluid great enough to form drops but not enough to cause drops to drip from item being checked/inspected.

CLASS III Leakage of fluid great enough to form drops that fall from the item being checked/inspected.

CAUTION

Equipment operation is allowable with minor leakage (Class I or II). Of course, consideration must be given to the fluid capacity in the item/system being checked/inspected. When in doubt, notify your supervisor.

When operating with Class I or II leaks, continue to check fluid levels as required in your PMCS.

Class III leaks should be reported to your supervisor or to organizational maintenance.

Operation of equipment is not permitted when any type of fuel leak is detected (Class I, II, or III).

Table 3-01. Operator/Crew Preventive Maintenance Checks and Services
B—Before D—During A—After W—Weekly M—Monthly

| Item No. | Interval | | | | | ITEM TO BE INSPECTED Procedure: Check for and have repaired, filled, or adjusted as needed | Equipment is not ready/ available if: |
|----------|----------|---|---|---|---|---|--|
| | B | D | A | W | M | | |
| 1 | • | | | | | <p>NOTE PERFORM WEEKLY AS WELL AS BEFORE PMCS IF:</p> <p>a. You are the assigned operator but have not operated ditching machine since the last weekly.</p> <p>b. You are operating the ditching machine for the first time.</p> <p>MAKE THE FOLLOWING WALK AROUND CHECKS:</p> <p>a. Check for evidence of leakage (oil, fuel, hydraulic fluid, or coolant) on or under the ditching machine.</p> <p>b. Visually check lights for broken lens, accumulation of foreign materials detracting from visibility.</p> <p>c. Check tires for damage or low pressure (correct pressure is 40 psi).</p> <p>d. Check that fire extinguisher is in proper place and has proper pressure. Needle on gage should be in white area.</p> <p>e. Visually check for loose, missing, or damaged parts.</p> <p>RADIATOR Check level. Fill to 2 inches below filler neck.</p> <p>ALCOHOL EVAPORATOR Check fluid level. At temperatures below 32°F evaporator must not run empty. Fill to 1 inch below cover.</p> <p>FUEL FILTER AND STRAINER Open drain cocks to drain off water and sediment. (Drain in suitable container for convenient disposal).</p> <p>NOTE Check level and prime with fuel before starting, if necessary.</p> <p>V-BELTS Check fan, alternator, and water pump belts for frayed condition or deterioration.</p> <p>AIR CLEANER Check air restriction indicator. If red signal is in full view, remove and clean filter element. Empty dust cup.</p> <p>BATTERIES Check level of electrolyte. If low, fill with clean water (distilled if possible) to the split ring. In freezing weather, run engine at least 15 minutes after adding water.</p> <p>AIR RESERVOIRS Drain moisture and sediment.</p> <p>INSTRUMENTS Check for proper operation. Normal readings are as follows:</p> <p>a. WATER TEMP 160°F to 180°F</p> <p>b. ENGINE OIL PRESSURE 40 psi</p> <p>c. BATTERY GENERATOR INDICATOR Yellow area</p> <p>d. AIR PRESSURE 90 psi</p> <p>e. TRANSMISSION CLUTCH PRESSURE 100 psi to 175 psi</p> <p>f. CONVERTER TEMP 130°F to 250°F</p> <p>BUCKET LINE Immediately after digging, remove all packed soil from bucket line side links and inside of boom cover assembly.</p> <p>ENGINE Check engine oil level. Add oil as indicated on dipstick.</p> | <p>Class III leakage is evident (no fuel leakage is allowed).</p> <p>Tires have cuts or abrasions which would result in tire failure during operation. One or more tires missing or unserviceable.</p> |
| 2 | | | | | | | |
| 3 | | | | | | | |
| 4 | | | | | | | |
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| 9 | | | | | | | |
| 10 | | | | | | | |
| 11 | | | | | | | |

Section III.1. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES

3-7.1. General

To insure that the ditching machine is ready for operation at all times, it must be inspected systematically so that defects may be discovered and corrected before they result in serious damage or failure. Table 3-0.1 contains a tabulated listing of preventive maintenance checks and services to be performed by organizational maintenance personnel. All deficiencies and shortcomings will be recorded as well as the corrective action taken on DA Form 2404 at the earliest possible opportunity.

3-7.2. Organizational Preventive Maintenance Checks and Services

a. The item numbers of table 3-0.1 indicate the sequence of the PMCS. Perform at the intervals shown below:

- (1) Do the (Q) checks and services once each three months.
 - (2) Do the (S) checks and services twice a year, or each six months.
 - (3) Do the (A) checks and services once each year.
 - (4) Do the (B) checks and services once each two years.
 - (5) Do the (H) checks and services at the hour interval listed.
 - (6) Do the (MI) checks and services when the mileage of the ditching machine reaches the amount listed.
- b. If something doesn't work, troubleshoot it with the instructions in this manual and notify your supervisor.
- c. Always do your PREVENTIVE MAINTENANCE in the same order, so it gets to be a habit. Once you've had some practice, you'll spot anything wrong in a hurry.
- d. If anything looks wrong and you can't fix it, write it on your DA Form 2404. If you find something seriously wrong, report it to direct support as soon as possible.

WARNING

Drycleaning solvent, SD-2 used to clean parts, is potentially dangerous to personnel and property. Do not use near open flame or excessive heat. Flash point of solvent is 138°F.

(1) *Keep it clean.* Dirt, grease, oil, and debris only get in the way and may cover up a serious problem. Clean as you work and as needed. Use drycleaning solvent (SD-2) to clean metal surfaces. Use soap and water when you clean rubber or plastic material.

(2) *Bolts, nuts, and screws.* Check that they are not loose, missing, bent, or broken. You can't try them all with a tool, of course. But look for chipped paint, bare

metal, or rust around bolt heads. Tighten any that you find loose.

(3) *Welds.* Look for loose or chipped paint, rust, or gaps where parts are welded together. If you find a bad weld, report it to direct support.

(4) *Electric wires and connectors.* Look for cracked or broken insulation, bare wires, and loose or broken connectors. Tighten loose connections and make sure the wires are in good condition.

(5) *Hoses and fluid lines.* Look for wear, damage, and leaks. Make sure clamps and fittings are tight. Wet spots show leaks, of course. But a stain around a fitting or connector can mean a leak. If a leak comes from a loose fitting or connector, tighten it. If something is broken or worn out, either correct it or report it to direct support (refer to MAC chart).

e. It is necessary for you to know how fluid leakage affects the status of your equipment. The following are definitions of the types/classes of leakage you need to know to be able to determine the status of your equipment. Learn, then be familiar with them and REMEMBER—WHEN IN DOUBT, NOTIFY YOUR SUPERVISOR!

Leakage definitions for Organizational PMCS

- | | |
|-----------|--|
| CLASS I | Seepage of fluid (as indicated by wetness or discoloration) not great enough to form drops. |
| CLASS II | Leakage of fluid great enough to form drops but not enough to cause drops to drip from item being checked/inspected. |
| CLASS III | Leakage of fluid great enough to form drops that fall from the item being checked/inspected. |

CAUTION

Equipment operation is allowable with minor leakage (Class I or II). Of course, consideration must be given to the fluid capacity in the item/system being checked/inspected. When in doubt, notify your supervisor.

When operating with Class I or II leaks, continue to check fluid levels as required in your PMCS.

Class III leaks should be reported to your supervisor or to organizational maintenance.

Operation of equipment is not permitted when any type of fuel leak is detected (Class I, II, or III).

Q—Quarterly
S—SemiannuallyA—Annually
B—BienniallyH—Hours
MI—Miles

| Item No. | Interval | | | | | | ITEM TO BE INSPECTED Procedure |
|----------|----------|---|---|---|-----|----|--|
| | Q | S | A | B | H | MI | |
| | | | | | | | NOTE PERFORM OPERATOR/CREW PMCS PRIOR TO OR IN CONJUNCTION WITH ORGANIZATIONAL PMCS. |
| 1 | • | | | | | | ENGINE EMERGENCY SHUT OFF LEVER Inspect latch mechanism and release cable for proper operation. Be sure to latch the lever in the open-valve position. |
| 2 | • | | | | | | COOLING SYSTEM a. Check radiator for damage or obstructions. Remove any debris which would restrict air flow. b. Inspect hoses and lines for evidence of leaks, abrasions, kinked or restricted areas, and insecure mounting. c. Drain and flush radiator and engine. d. Check antifreeze protection (Ref TB 750-651). |
| 3 | • | | • | • | | | HYDRAULIC OIL COOLER Clean exterior and check for leaks and loose or damaged hoses and fittings. |
| 4 | | | | | 250 | | FUEL FILTER AND STRAINER Remove and clean body shells and replace filter elements. |
| 5 | • | | | | | | V-BELTS AND PULLEYS a. Replace badly worn, frayed, or deteriorated belts. b. Check for loose or damaged pulleys. c. Check belt tension. Correct adjustment is 3/4-inch deflection midway between pulleys. |
| 6 | • | | | | | | QUICK START Check tube and fittings for leaks. Replace cylinder if required. |
| 7 | • | | | | | | AIR RESERVOIRS Inspect tanks, lines, and fittings for leaks or damage. |
| 8 | • | | | | | | BATTERIES a. Remove corrosion. b. Tighten loose cables and mounts. c. Clean filler cap vent holes. d. Check specific gravity of electrolyte in each cell (ref. TM 9-6140-200-14). |
| 9 | • | | | | | | TRANSMISSION a. Clean breather. b. Tighten loose fittings. Replace damaged hoses, pipes, or fittings. |
| 10 | • | | | | | | AXLES AND SPROCKET DRIVE Clean breather fitting. Replace damaged breather. |
| 11 | • | | | | | | BUCKET LINE Inspect for badly worn teeth and proper adjustment (2 to 3 inches sag). |
| 12 | • | | | | | | DRIVE SPROCKETS AND CHAINS a. Inspect for excessive wear. b. Check for loose or missing headshaft sprocket bolts. Torque to 130 ft-lbs. |
| 13 | • | | | | | | HOIST CABLE AND SHEAVES Inspect for excessive wear and damage. |
| 14 | • | | | | | | CONVEYOR a. Inspect belt and flashing for excessive wear and damage. b. Inspect drums and rollers for misalignment and damage. |
| 15 | • | | | | | | FUEL TANK a. Inspect for damage, loose mounting, or loose connections. b. Inspect filler cap. Clean strainer. c. Drain off water and dirt. |
| 16 | • | | | | | | BRAKES a. Inspect brake chambers and lines for leaks or damage. b. Reset slack adjusters as required. |

Figure 3-3(1), 3-3(2), and 3-3(3). Deleted.

Page 3-15.

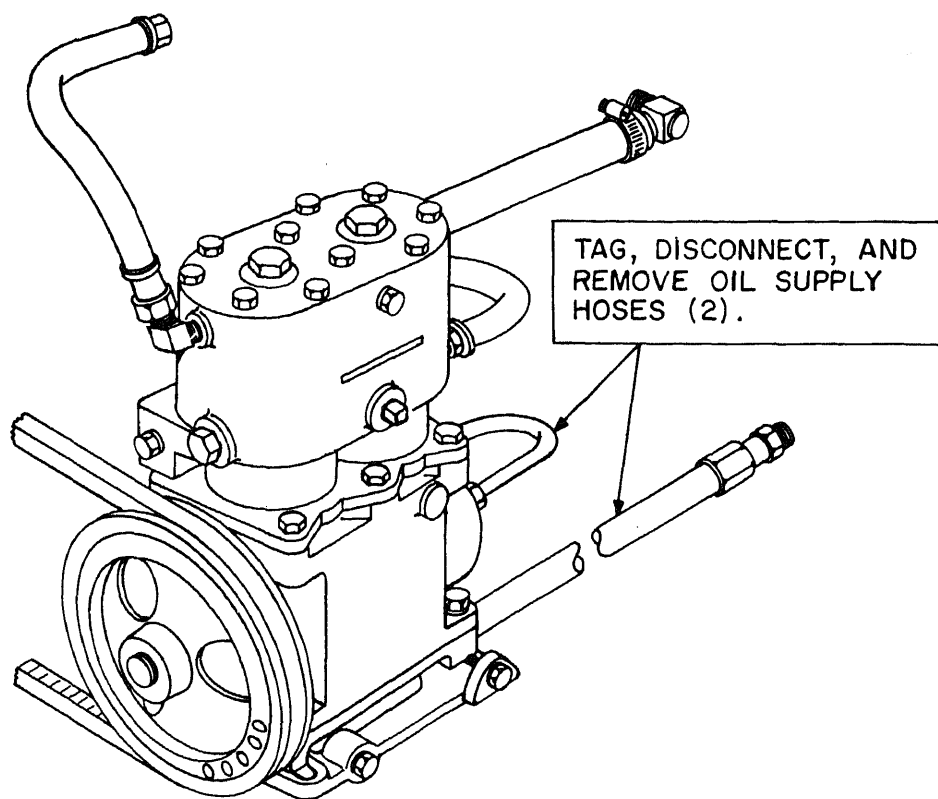
Paragraph 3-20 change paragraph heading "3-20" to "3-30"

Paragraph 3-30, Possible remedy column. Change "20-23 psi" to "15 ± 1 psi".

Page 3-30, figure 3-30 change "(FIG. 3-32)" to "(FIG. 3-29)".

Page 3-32, paragraph 3-52e change "figure 3-63" to "figure 1-3".

Page 3-66. Figure 3-80 is superseded as follows.



TA 072370

Figure 3-80. Air compressor oil hoses.

8, figure 3-82. Procedure No. 2 is superseded as

2. Adjust slack adjuster travel to $\frac{1}{8}$ to $\frac{1}{4}$ inch.
 Page 3-69, figure 3-83 is superseded as follows.

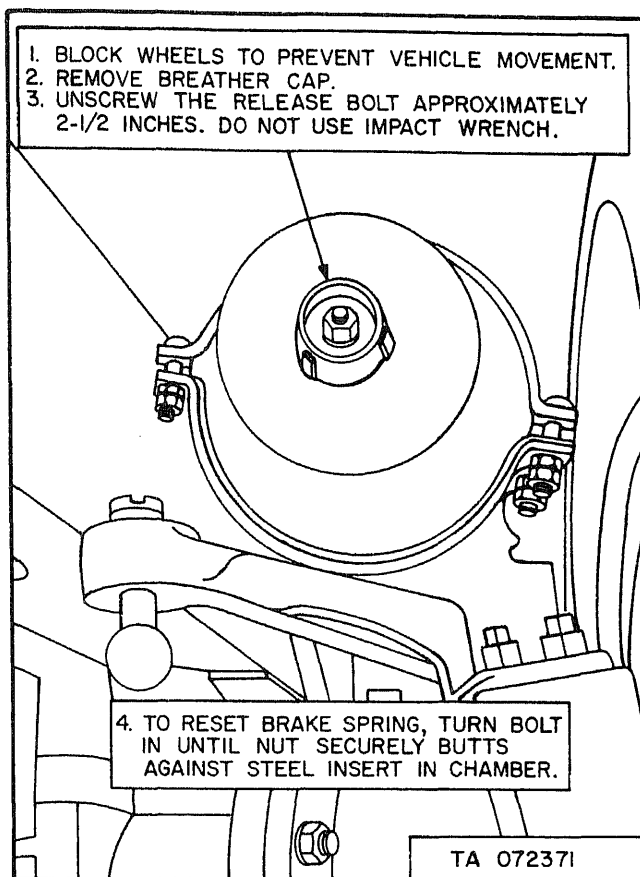


Figure 3-83. Spring brake, manual release.

Page 3-79, following paragraph 3-84e add the following:

NOTE

While greasing conveyor belt idler bearings, insure that grease is forced out around *inner* bear-

ing race. If no grease is observed, remove the bearing and clean out the grease holes in the outer race.

Page 3-121. Figure 3-157 is superseded as follows.

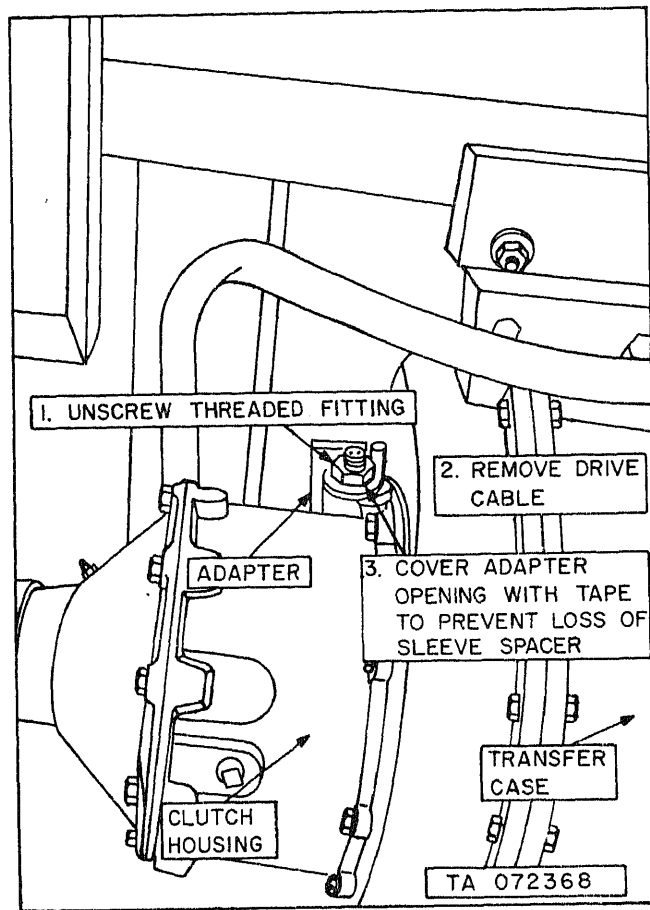


Figure 3-157. Transfer case lubrication components.

Page 3-122, figure 3-159 is superseded as follows.

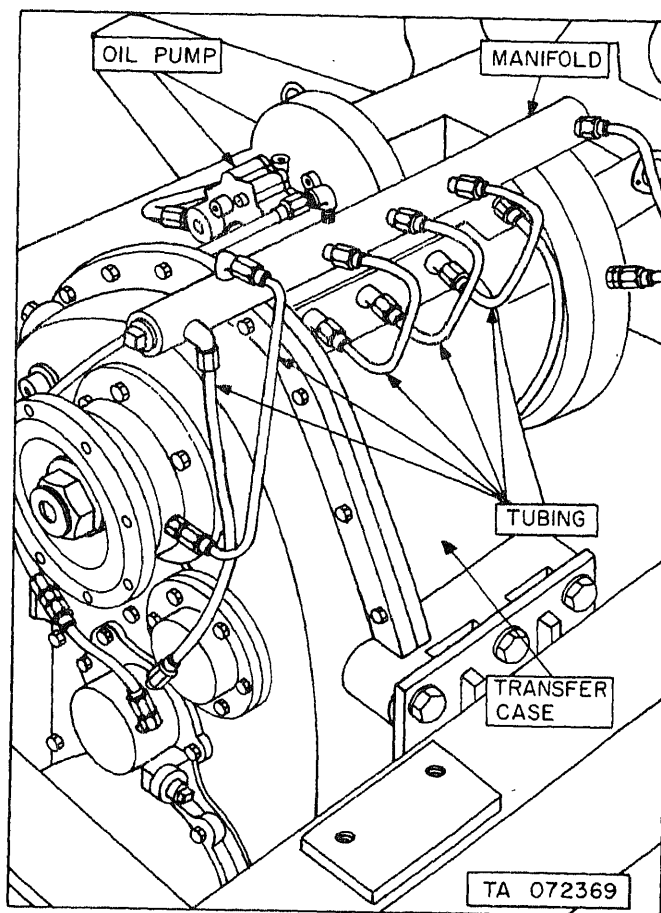


Figure 3-159. Speedometer drive cable, removal and installation.

, paragraph A-4.

n 1. Change "TB ORD 651" to "TB 750-651".

the following.

750-28 Instructions for the Safe Handling

Maintenance, Storage, and Disposal of Radioactive Material Managed by USAMECOM.

Page B-1, appendix B is superseded as follows:

APPENDIX B BASIC ISSUE ITEMS LIST AND ITEMS TROOP INSTALLED OR AUTHORIZED

Section 1. INTRODUCTION

cope

endix lists items required by the operator for
of the ditching machine.

eneral

s divided into the following sections:

ic Issue Items List—Section II. Not applicable.

ns Troop Installed or Authorized List—Section

t of items in alphabetical sequence, which at the

of the unit commander may accompany the

machine. These items are NOT SUBJECT TO

N with the ditching machine when evacuated.

B-3. Explanation of Columns

The following provides an explanation of columns in the tabular list of Items Troop Installed or Authorized, Section III.

a. *Source, Maintenance, and Recoverability Code(s) (SMR).* Not applicable.

b. *National Stock Number.* This column National stock number used for requisitioning

c. *Description.* The name and any additi

d. Unit of Measure (U/M). A 2 character alphabetical abbreviation indicating the amount or quantity of the item upon which the allowances are based, e.g., ft, ea, pr, etc.

e. Quantity Authorized (Items Troop Installed or Authorized). This column indicates the quantity of the item authorized to be used with the equipment.

Section III. ITEMS TROOP INSTALLED OR AUTHORIZED LIST

| (1) SMR code | (2) National stock number | (3) Description Ref. No. & Mfr. code | Usable on code | (4) Unit of meas | (5) Qty auth |
|--------------------|--------------------------------------|---|-------------------|---------------------------|--------------------|
| | 7520-00-559-9618 4210-00-889-2221 | CASE, Maintenance and Operation Manuals EXTINGUISHER, Fire | | EA EA | 1 1 |

Page C-4, Group No. 0710, Transmission Assembly, column (4) add "1-B".

Page C-5.

Group No. 1410, Hydraulic Pump Assembly.

Column (3)B add "F".

Column (4) add "1-B".

Group No. 4302, Pumps.

Column (3)B add "F".

Column (3)H change "H" to "F".

Column (4) add "1-B".

Group No. 4305, Manifold Control Valve.

Column (4) add "1-B".

Group No. 4306, Hydraulic Motor.

Column(3)B add "F".

Column (4) add "1-B".

Page C-6. Section III.

Reference code column, add "1-B".

Maintenance level column, add "F".

Nomenclature column, change "None required" to "Tester, Hydraulic Circuit".

Tool number column add "4910-00-868-6871 PT100E (08832)".

Page I-6, Table 3-1. Change "Table 3-1" to "Table 3-3".

Official:

J. C. PENNINGTON

Major General, United States Army

The Adjutant General

BERNARD W. ROGERS
General, United States Army
Chief of Staff

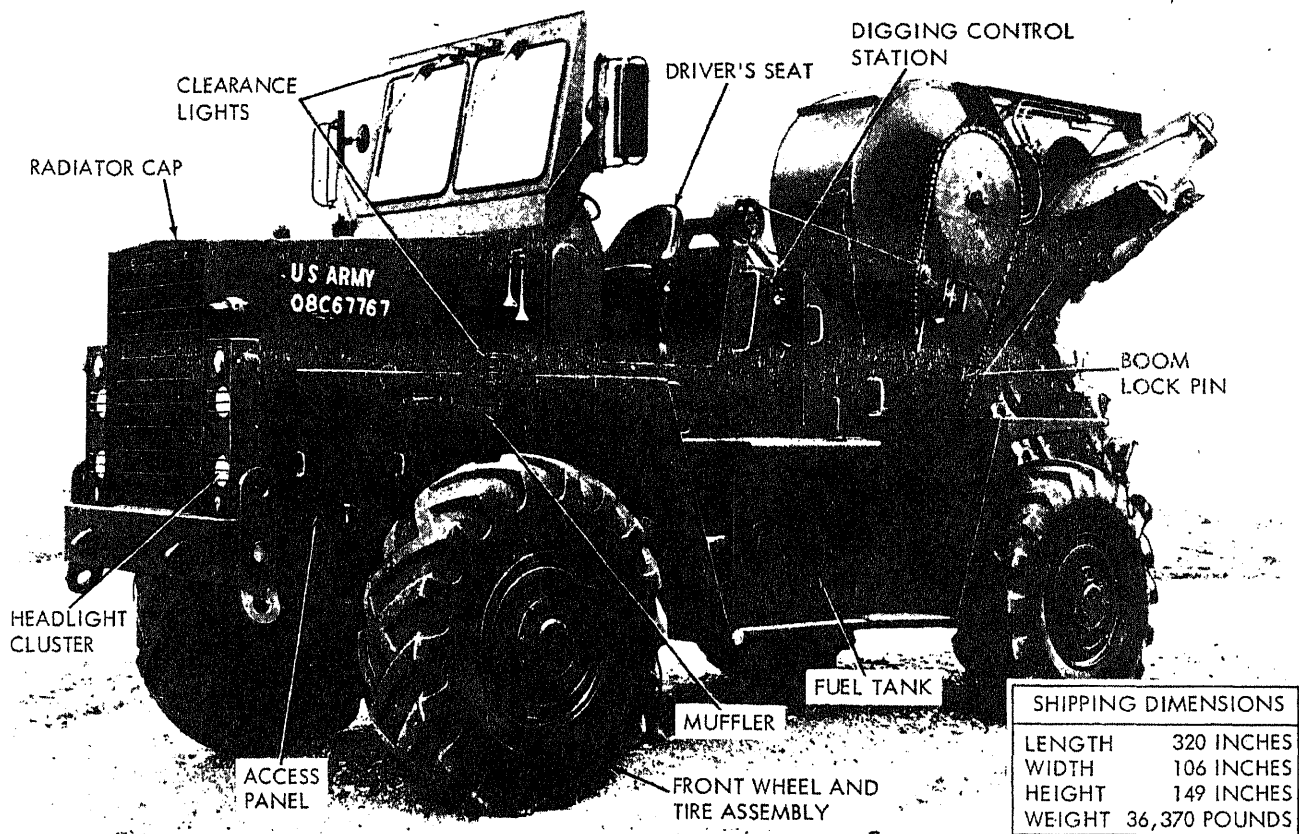
Distribution:

To be distributed in accordance with DA Form 12-25B, Organizational maintenance requirements for Earth Moving Equipment, Ditcher and Intrenchers.

OPERATOR AND ORGANIZATIONAL MAINTENANCE MANUAL

DITCHING MACHINE: DIESEL ENGINE DRIVEN; WHEEL
MOUNTED; LADDER TYPE: 6 FT DEPTH OF CUT, 24 INCH
WIDTH OF CUT (PARSONS MDL 624VL)
FSN 3805-050-4638

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MEC3805-240-12/1-1

Figure 1-1. Ditching machine, left-front, three-quarter view.

(3) *Lubricant guide plate.* Located on left rear panel. It gives data for fuel and lubricants to be used in the ditching machine at varying temperatures.

(4) *Operator's instruction plate.* Located on the digging station. It gives instructions for digging the trench.

(5) *Driving instruction plate.* Located on the dashboard. It gives driving instructions.

b. Tabulated Data.

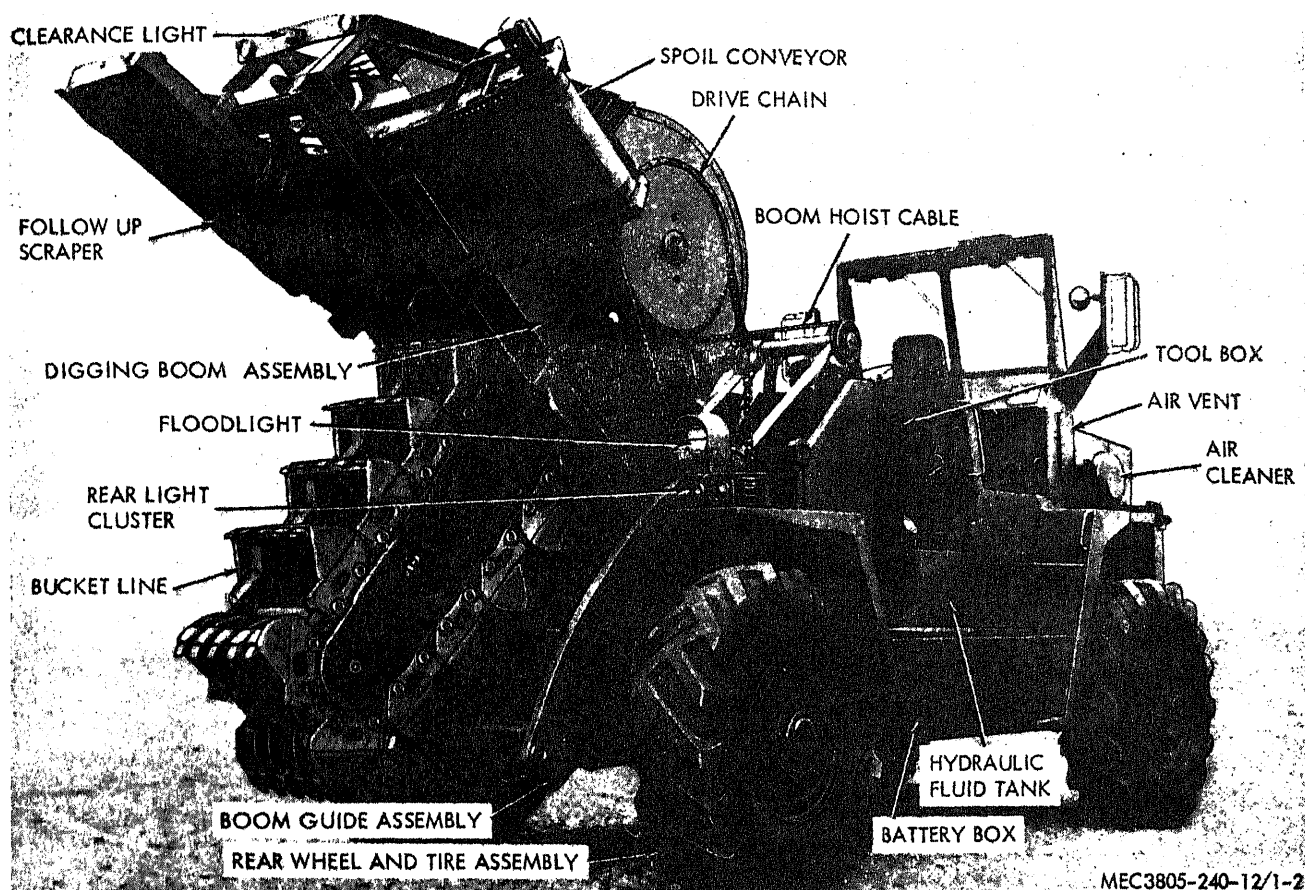
(1) *Ditching machine.*

Manufacturer ----- Parsons Division-Koehring Co.
 Model ----- 624 VL
 Type ----- Wheel mounted, vertical ladder
 Travel speed:
 Forward ----- 5.32 to 30.24 mph (miles per hour) at 2,100 rpm (revolutions per minute)
 Reverse ----- 4.5 mph
 Digging speed ----- 0 to 20 fpm (feet per minute)
 Digging range:
 Width ----- 24 in. (inches)
 Depth ----- 0 to 6 ft. (feet)

Bucket line speed ----- 360 fpm, 255 fpm and 180 fpm at 2,100 rpm
 Turning circle ----- 75 ft.
 Wheel ----- 18.00 x 25
 Tire ----- 18.00 x 25
 Tire pressure ----- 40 psi (pounds per square inch)

(2) *Engine.*

Manufacturer ----- Detroit Diesel Engine Division of General Motors Corporation
 Model ----- 6V-71 S70 Series
 Type ----- Diesel, valve-in-hand
 Number of cylinders ----- 6
 Cylinder arrangement ----- Vee
 Method of cooling ----- Liquid
 Cycle ----- 2
 Bore ----- 4 1/4 in.
 Stroke ----- 5 in.
 Piston displacement ----- 42 cu. in. (cubic inches)
 Compression ratio ----- 17 to 1
 Horse power ----- 238 bhp (brake horsepower) at 2,100 rpm
 Governed full load ----- 2,100 rpm
 Idle speed ----- 550 rpm
 Lubrication ----- Full pressure
 Firing order ----- 1L, 3R, 3L, 2R, 1R (viewed from rear of engine)



MEC3805-240-12/1-2

Figure 1-2. Ditching machine, right-rear, three-quarter view.

(3) Alternator.

Manufacturer _____ Leece-Neville Company
Model _____ A 001 2086 A.A.
Volts _____ .28
Amperes _____ 35
Watts _____ 1050

(4) Regulator.

Manufacturer _____ Leece-Neville Company
Model _____ R 001 3598 R.A.
Volts _____ .28
Amperes _____ 60 max.

(5) Air cleaner.

Manufacturer _____ Donaldson Company
Model _____ FWG14-0077

(6) Starter motor.

Manufacturer _____ Delco-Remy Division of
General Motors Corpora-
tion
Model _____ 1118847

(7) Lubricating oil filter.

Manufacturer _____ AC Spark Plug Division of
General Motors Corpora-
tion

Model _____ 5134553
Element _____ 5574542

(8) Fuel filter.

Manufacturer _____ AC Spark Plug Division of
General Motors Corpora-
tion
Model _____ 5574558
Element _____ 5574508

(9) Fuel strainer.

Manufacturer _____ AC Spark Plug Division of
General Motors Corpora-
tion
Model _____ 6486075
Element _____ 5575082

(10) Hydraulic fluid filters.

(a) In-line.

Manufacturer _____ Marvel Engineering Com-
pany
Model _____ 303162-2500
Element _____ 560206-5110

(b) Return.

Manufacturer _____ Marvel Engineering Com-
pany
Element _____ M 2876-10

(c) *Suction.*

Manufacturer ----- Marvel Engineering Com-
pany
Model ----- 650-1-1/2-100
Element ----- M2940

(11) *Muffler.*

Manufacturer ----- Donaldson Company
Model ----- MFM08-0011

(12) *Battery.*

Group ----- MS 35000-3
Type ----- BB-248/U (6TN)
Volts ----- 12
Ground polarity ----- Negative

(13) *Radiator.*

Manufacturer ----- Perfex Corporation
Model ----- R-8401

(14) *Personnel cab heater.*

Manufacturer ----- Kysor of Byron, Division
of Kysor Industrial
Corporation
Model ----- K708-3

(15) *Hydraulic pumps.*

(a) *Crowd drive pump.*

Manufacturer ----- Vickers Incorporated
Model ----- M-PVB29-LDE-10-DA-10

(b) *Conveyor drive pump.*

Manufacturer ----- Vickers Incorporated
Model ----- M-PVB15-US-20-ML-
10-068

(c) *Main and steering pump.*

Manufacturer ----- Vickers Incorporated
Model ----- V2020F-1F9S9S-
11CA6H10R

(16) *Power steering unit.*

Manufacturer ----- R. H. Sheppard Company
Model ----- 592-H

(17) *Hydraulic motors.*

(a) *Crowd drive motor.*

Manufacturer ----- Vickers Incorporated
Model ----- 25M65A-1C20

(b) *Conveyor drive motors.*

Manufacturer ----- Commercial Shearing &
Stamping Company
Model ----- M25X-907-BE-YC-17-58

(c) *Conveyor shift motor.*

Manufacturer ----- Char-Lynn
Model ----- B-P

(18) *Hydraulic valves.*

(a) *Directional control-conveyor.*

Manufacturer ----- Gresen Manufacturing
Company
Model ----- WP-DF4-HP

(b) *Relief and replenishing.*

Manufacturer ----- Vickers Incorporated
Model ----- VRR2-T20-10

(c) *Four-section control.*

Manufacturer ----- Gresen Manufacturing
Company
Model ----- CP-1083

(d) *Overcenter control-hoist cylinders.*

Manufacturer ----- Fluid Controls Incorporated
Model ----- 1E11-P8T-30

(19) *Transfer case.*

Manufacturer ----- FWD Corporation
Model ----- 630X

(20) *Air compressor.*

Manufacturer ----- Bendix-Westinghouse
Automotive Air Brake
Company
Model ----- Tu-Flo 500

(21) *Transmission/torque converter.*

Manufacturer ----- Allison Division, General
Motors Corporation
Model ----- CLT-4460

(22) *V-belts.*

(a) *Fan.*

Manufacturer ----- Detroit Diesel
Model ----- 5130693
Number ----- Three

(b) *Alternator.*

Manufacturer ----- Detroit Diesel
Model ----- 5133176
Number ----- Two

(c) *Air compressor.*

Manufacturer ----- Detroit Diesel
Model ----- 5137905
Number ----- One

(23) *Adjustment data.*

V-belts ----- 1/2 to 3/4 in deflection
between pulleys
Bucket-line ----- 2 in. slack on front of
bucket line
Bucket-line drive chains ----- 1 1/2 to 2 in. deflection
between sprockets on
lower strand

(24) Nut and bolt torque data.

| | |
|--|---|
| Governor variable speed spring lever set screw. | 12-15 ft.-lb. (foot-pounds) |
| Thermostat housing bolts | 20-35 ft.-lb. |
| Exhaust manifold stud nuts | 30-35 ft.-lb. |
| Starter mounting screws | 13-17 ft.-lb. |
| Lubricating oil filter center stud. | Caution: Should only be tightened enough to prevent leaks around shell or stud gaskets. |

(25) Capacities.

| | |
|----------------------------|--|
| Cooling system | 10 gals. (gallons) |
| Fuel tank | 100 gals. |
| Crankcase | 20 qts. (quarts) |
| Transmission | 8.75 gals. initial fill; 6.5 gals. refill |
| Transfer case | 14 qts. |
| Steering gearbox | 0.5 pt. (pint) |
| Axle planetary gearcase | 2 qts. each |
| Rear axle differential | 18 qts. |
| Front axle differential | 18 qts. |
| Bucket-line drive gearcase | 6 qts. |
| Hydraulic fluid tank | 75 gals. initial fill; 53 gals. refill |
| Power cluster | 1 pt. each |

(26) Dimensions and weights (fig. 1-1).**Overall dimensions:**

| | |
|-----------|---------|
| Length | 320 in. |
| Width | 106 in. |
| Height | 149 in. |
| Wheelbase | 160 in. |

Ground clearance:

| | |
|---------------|--------|
| Under chassis | 20 in. |
| Under boom | 18 in. |

Center of gravity:

| | |
|--------------|-------------|
| Vertical | 59.08 in. |
| Longitudinal | 59.48 in. |
| Weight | 36,370 lbs. |

(27) Wiring diagram. See figure number 1-3.

1-5. Difference in Models

This manual covers only the Parsons Model 624 VL Ditching Machine. No known unit differences exist for the model covered by this manual.

Figure 1-3. Wiring diagram.
(Located in back of manual)

6. REMOVE STRAPPING AND
WOODEN BOX (6).

4. REMOVE BLOCKS FROM
TIRE TREAD (6).

1. REMOVE STRAPPING AND
WOOD BLOCK (4).

2. REMOVE WHEEL
ASSEMBLY.

3. REMOVE
CABLE (8).

5. REMOVE BLOCKS FROM
TIRE SIDE WALL (4).

STEP A. TRAVEL POSITION.

14. RAISE CONVEYOR HOUSING
AND BOLT IN PLACE.

BATTERY BOX

15. STORE SHIP-
PING BRACKETS
ON BATTERY BOX.

9. MOVE DITCHER TOWARD BOOM.

13. REMOVE SHIPPING
BRACKET (2).

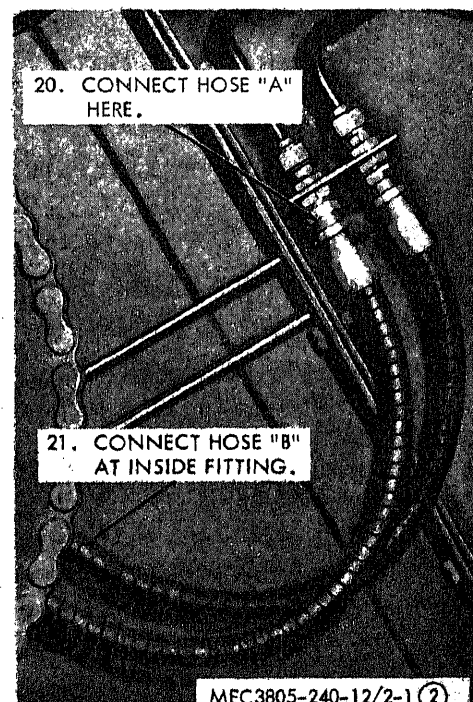
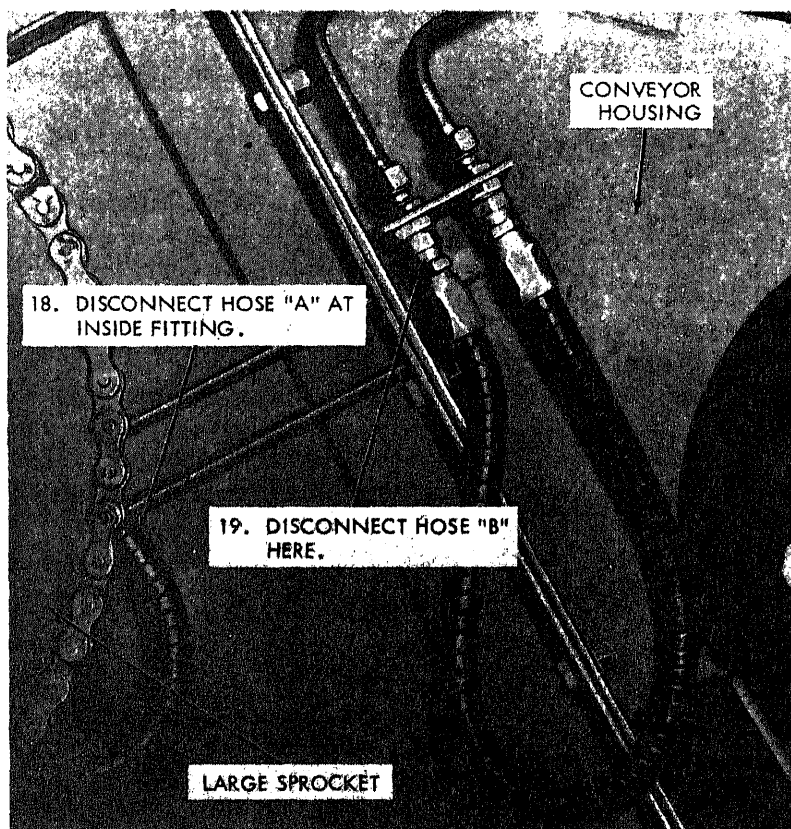
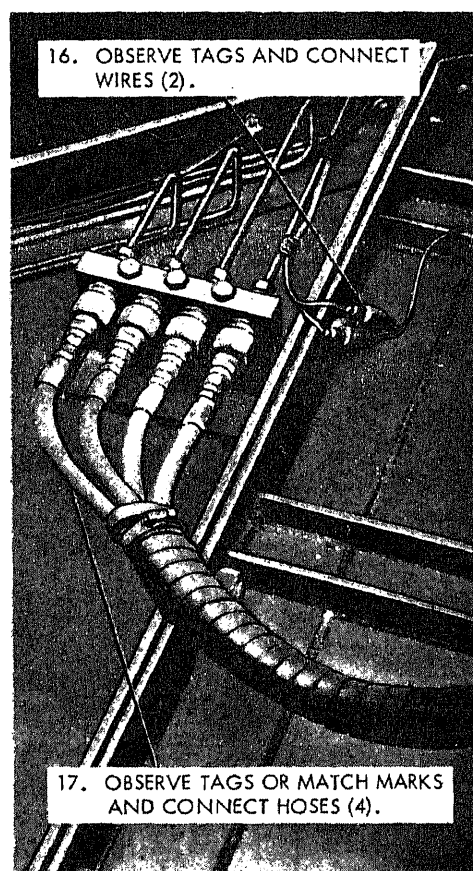
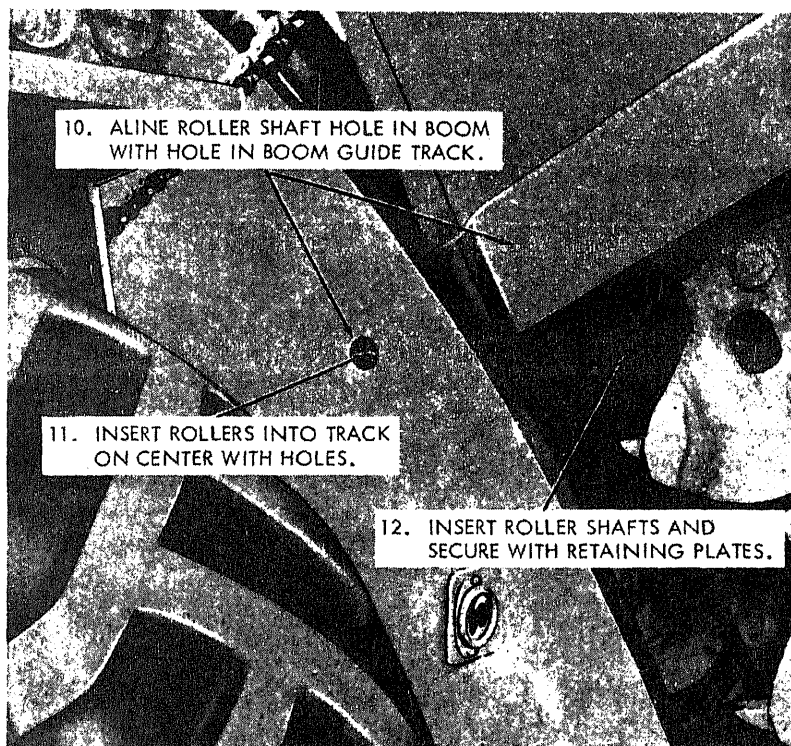
7. REMOVE CABLE (4).

8. REMOVE BLOCKING.

STEP B. BERNE INTERNATIONAL SHIPPING POSITION.

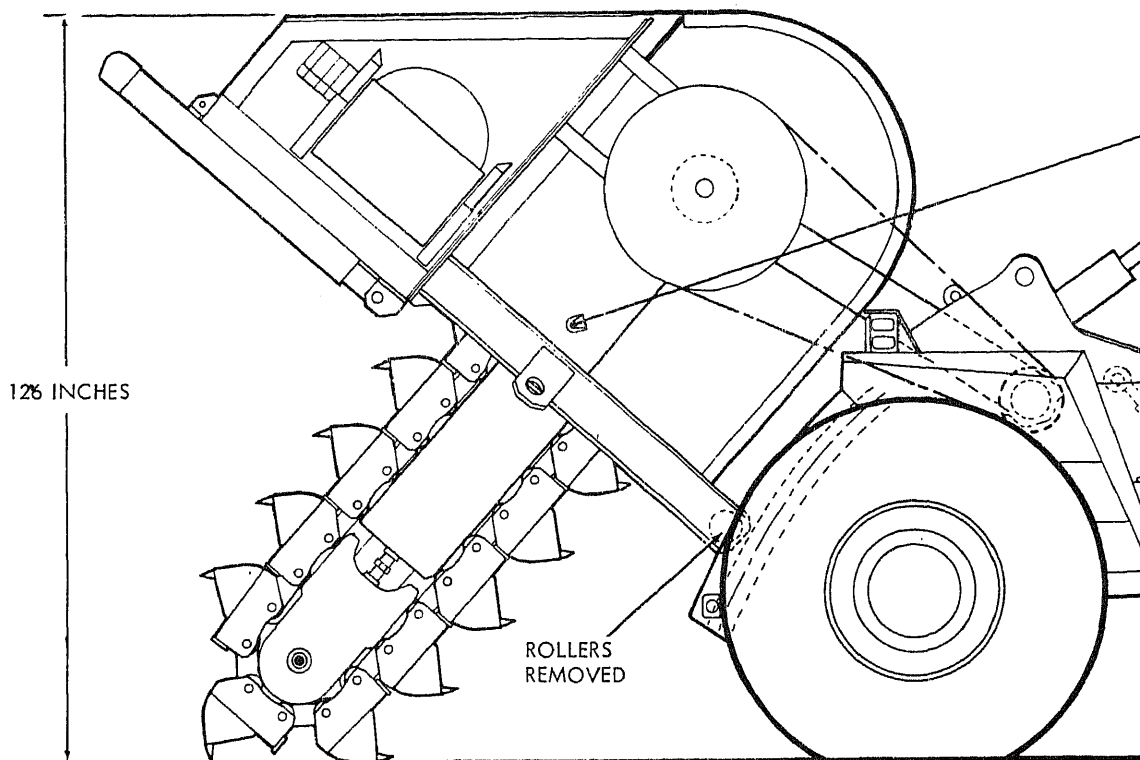
MEC3805-240-12/2-1 ①

Figure 2-1(1). Blocking and tie-down removal.



MEC3805-240-12/2-1 (2)

Figure 2-1(2)—Continued.



MEC3805-240-12/2-1 (3)

Figure 2-1(3)—Continued.

(3) Lower the machine and remove the slings.

Warning: Make sure the slings and hoists are securely fastened and the area is clear of personnel and obstructions.

2-2. Unpacking Equipment

a. Unpacking.

(1) The followup scraper may be strapped to the boom. Remove the strapping which secures the followup scraper to the boom.

(2) If the machine is shipped with dry batteries, electrolyte will be packed in a wooden box. Open the top of the electrolyte box and remove the bottles of electrolyte.

Warning: Use care when handling electrolyte. Severe burns can result from electrolyte spilled on the skin or clothing.

(3) Check the equipment against the packing list for possible loss of parts, tools, and publications during loading, unloading, or shipping. Report all shortages to the proper authority.

b. Removal of Protective Material and Devices.

(1) Prior to inspection or operation, depreserve the ditching machine as outlined on DA Form 2258 which will be found on or near the operator's controls.

(2) External lights on the machine may be covered with weatherproof tape. Remove all such tape from lights, instruments, and mufflers.

(3) Take the battery cables out of the battery compartment and remove the preservative from the cable ends.

2-3. Inspecting and Servicing the Ditching Machine

a. Inspecting.

(1) Make a complete visual inspection of the ditching machine.

(2) Check for dented or scratched body parts, bent or cracked frame, cracked or broken glass, windshield, lights, instruments, or gages.

(3) Inspect all components for proper mounting.

(4) Check all belts and drives for proper adjustment.

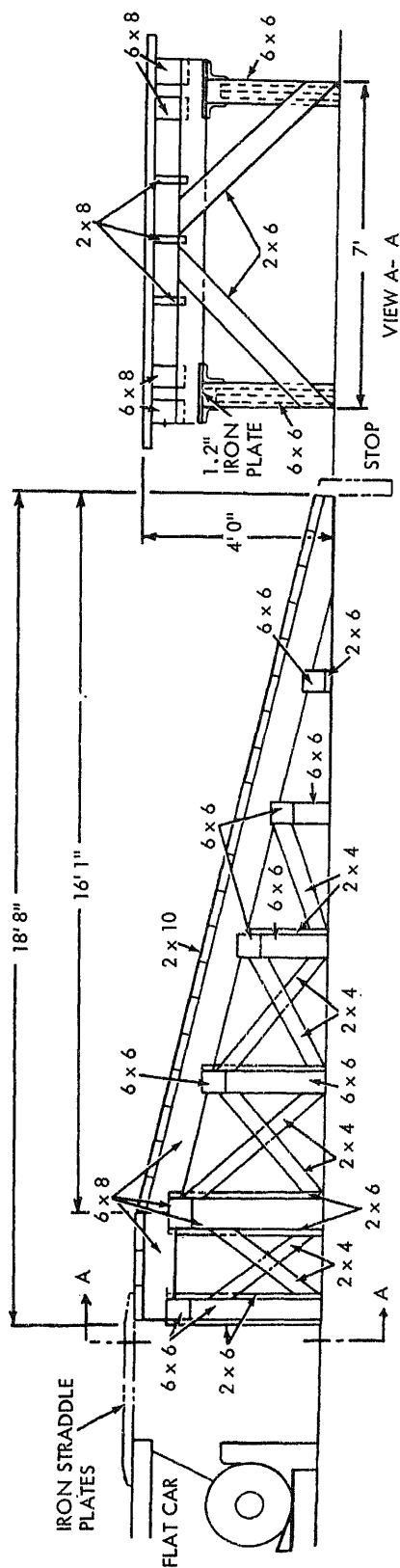
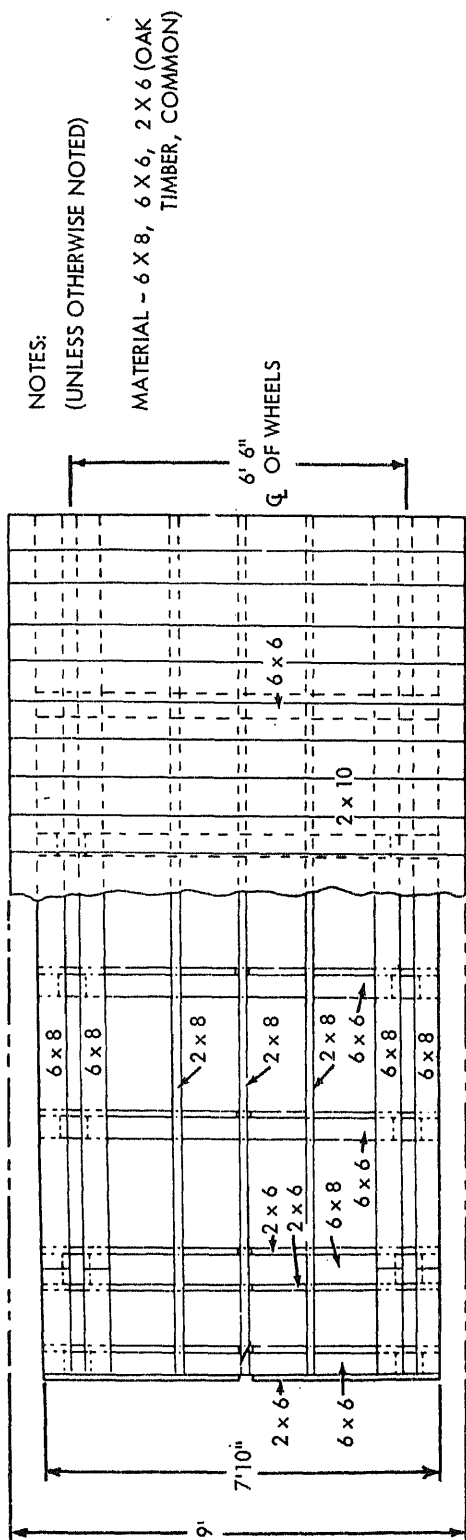


Figure 2-2. Unloading ramp construction.

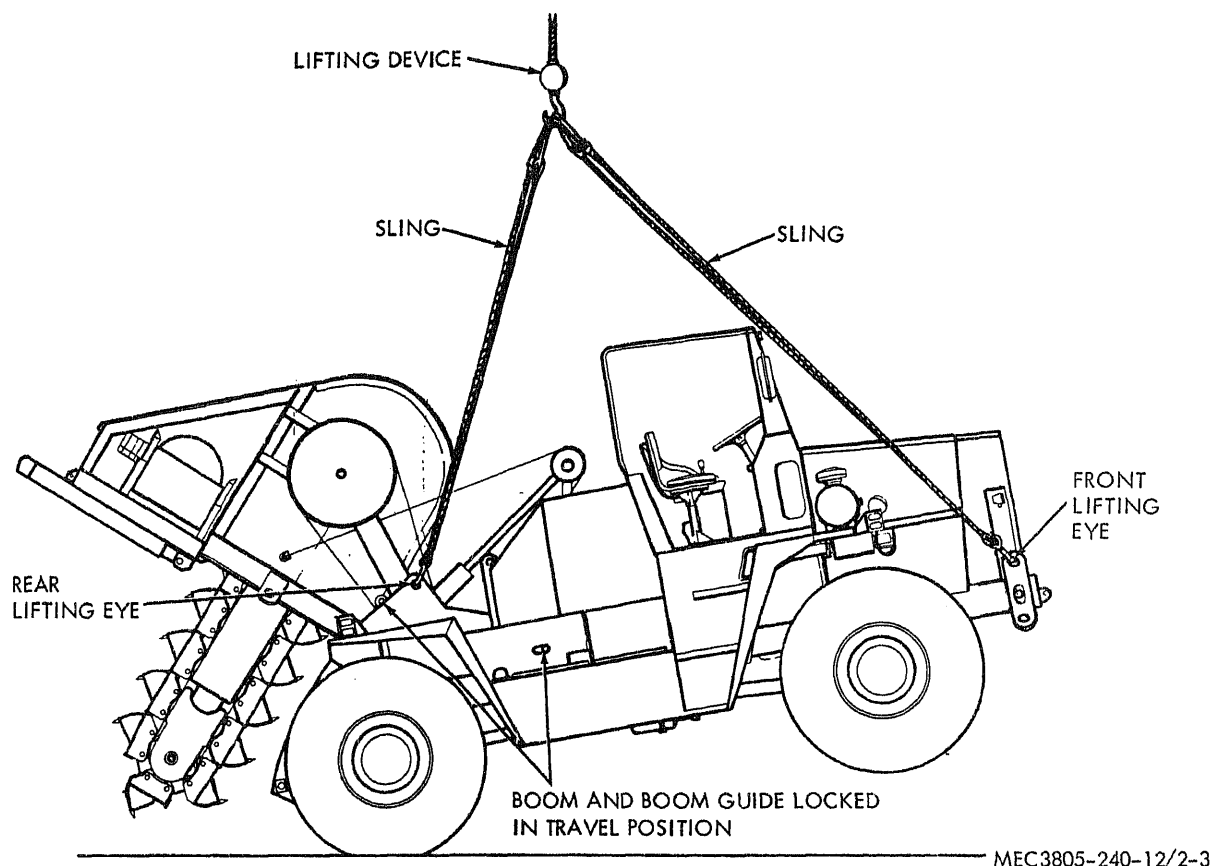


Figure 2-3. Lifting diagram.

Table 2-1. Freezing Points, Composition, and Specific Gravities of Military Antifreeze Materials

| Lowest expected ambient temp. °F | Pints of inhibited glycol per gal of coolant ¹ | Compound, Antifreeze Arctic ² | Ethylene glycol coolant solution specific gravity at 68° F ³ |
|----------------------------------|---|--|---|
| +20 | 1 1/2 | Issued full strength and ready mixed for 0 to -65° F temperatures for both initial installation and replenishment of losses. | 1.022 |
| +10 | 2 | | 1.036 |
| 0 | 2 3/4 | | 1.047 |
| -10 | 3 1/4 | | 1.055 |
| -20 | 3 1/2 | | 1.062 |
| -30 | 4 | DO NOT DILUTE WITH WATER OR ANY OTHER SUBSTANCE | 1.067 |
| -40 | 4 1/4 | | 1.073 |
| -50 | Arctic Antifreeze preferred. | | |
| -60 | | | |
| -75 | | | |

¹ Maximum protection is obtained at 60 percent by volume (4.8 pints of ethylene glycol per gallon of solution).

² Military Specifications MIL-C-11755 Arctic type, non-volatile antifreeze compound is intended for use in the cooling system of liquid-cooled internal combustion engines. It is used for protection against freezing primarily in Arctic regions where the ambient temperature remains for extended periods close to -40°F or drops below, to as low as -90°F.

³ Use an accurate hydrometer. To test hydrometer, use 1 part ethylene glycol antifreeze to 2 parts water. This should produce a hydrometer reading of 0°F.

Note. Fasten a tag near the radiator filler cap indicating the type antifreeze.

(5) Inspect all the equipment shipped with the ditching machine for possible damage.

(6) Report all damage to the proper authority.

b. Servicing.

(1) Remove caps from the battery cells and fill with electrolyte to a level of three-eighths inch above the plates.

Warning: Do not smoke or use open flame in the vicinity when servicing battery. Batteries generate hydrogen, a highly explosive gas.

(2) Remove rocker arm covers (para 3-86) and pour 2 quarts of engine oil over the rocker arms and fuel injectors. Replace rocker arm covers.

(3) Lubricate the ditching machine according to the current lubrication order (LO 5-3805-240-12).

(4) Perform all preventive maintenance services listed in paragraph 3-6.

(5) Table 2-1 lists the freezing points, composition, and specific gravities of military anti-freeze materials.

c. Hydraulic System Start-Up.

(1) Be sure all cylinders, pumps, and motors are filled with fluid, including the power cluster reservoirs under the driver's seat and the oil cooler.

(2) Fill the hydraulic fluid tank (LO 5-3805-240-12).

Caution: At temperatures of 32°F and below, be sure to use OES (MIL-L-10295) in the hydraulic system to prevent damaging hydraulic components.

Section II. MOVEMENT TO A NEW WORK SITE

2-6. Dismantling for Movement

a. No dismantling for movement is necessary on the ditching machine. Normally, the ditching machine will be driven short distances to new work sites. Followup scraper will be in raised position, secured to conveyor frame with keeper pins, when traveling in daylight. For night travel see paragraph 2-13 b (5).

(3) Loosen the outlet fittings on control valves, check valves, pumps, motors, and cooler.

(4) Move all control levers to neutral and pull out the crowd pump knob (fig. 2-4).

(5) Start the engine (para 2-11) and run at 550 rpm.

(6) Remove all retaining pins on boom, boom guide and follow-up scraper. Operate control levers back and forth gently to purge air from cylinders.

(7) Air and fluid will bleed out through the loose fittings. Tighten each fitting in turn as soon as air disappears from the stream of fluid.

(8) Check fluid level in tank and add fluid if required. Fluid level should be between the end of gage and full mark. Check for air bubbles in the tank. The fluid should clear up in a short time if air is not leaking into the system. If bubbles persist, tighten all connections; especially at pump inlet ports.

(9) In cold weather, do not operate hydraulic components under load until they are properly warmed up (para 2-14).

2-4. Installation of Separately Packed Components

a. Install the rifle case.

b. Install the fire extinguisher.

2-5. Installation or Setting-up Instructions

No installation or setting-up procedures are required. The ditching machine arrives ready for operation.

b. For movement other than short distances, position the ditching machine on a flat car or trailer and secure as illustrated on figure 2-1.

2-7. Reinstallation after Movement

No reinstallation procedures are required. The ditching machine arrives ready for operation.

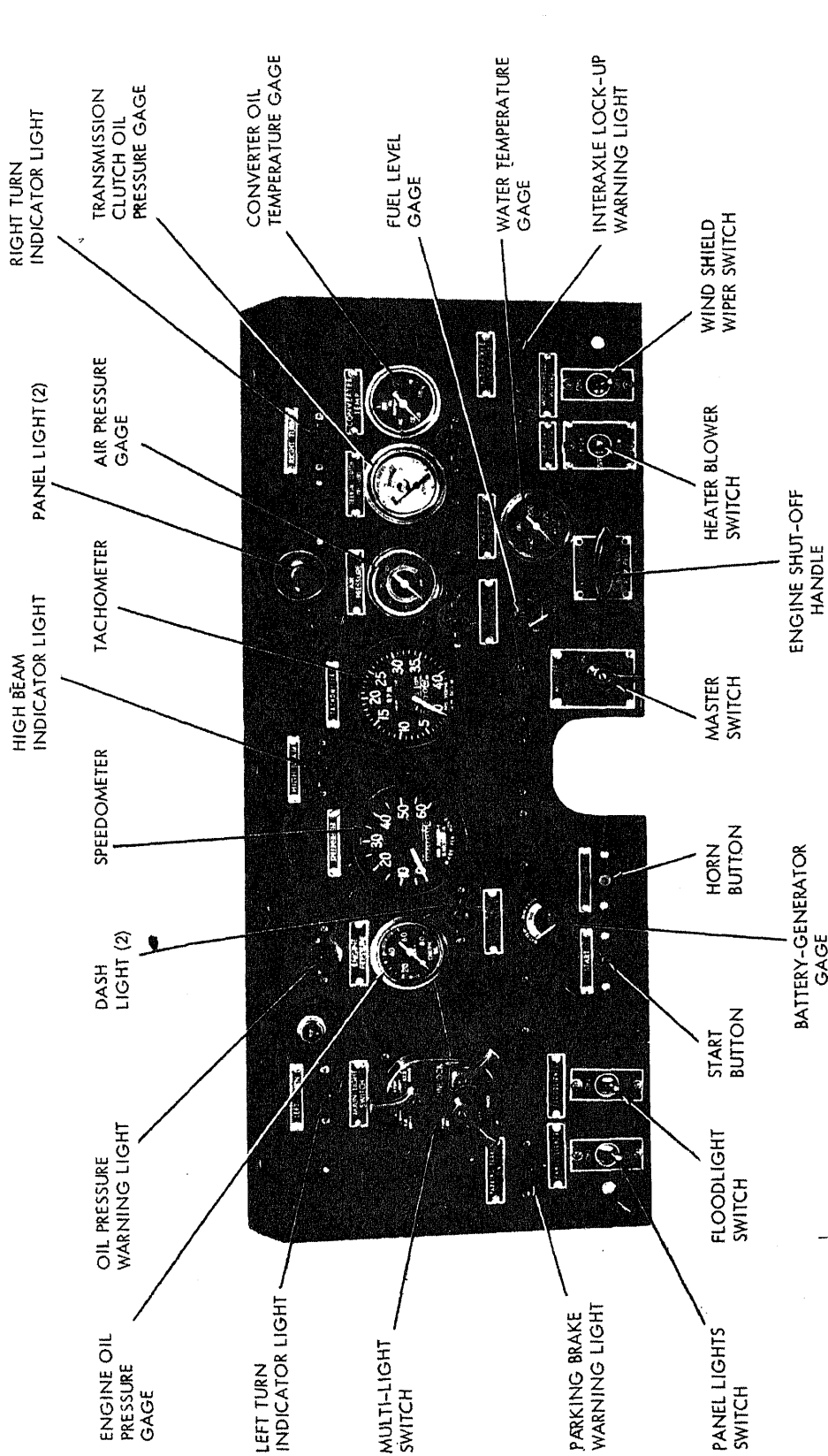
Section III. CONTROLS AND INSTRUMENTS

2-8. General

This section describes, locates, illustrates, and furnishes operator, crew, or organizational maintenance personnel sufficient information about various controls and instruments for proper operation of the Parsons Model 624 VL ditching machine.

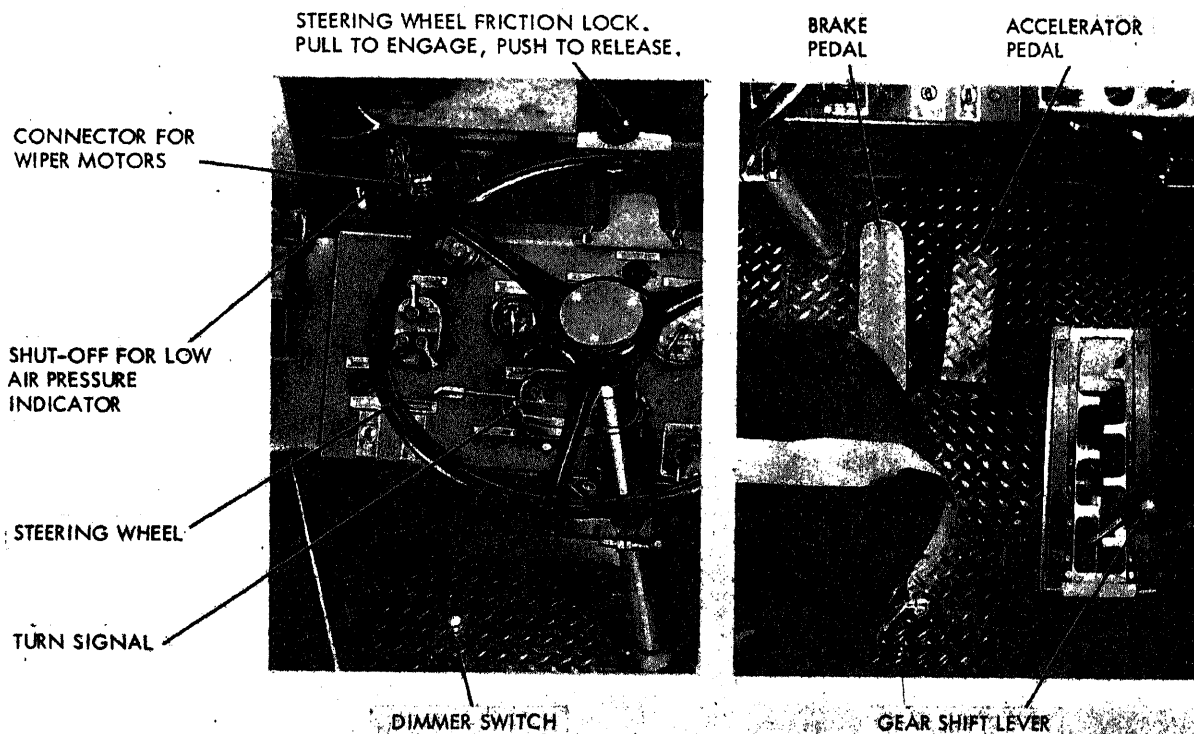
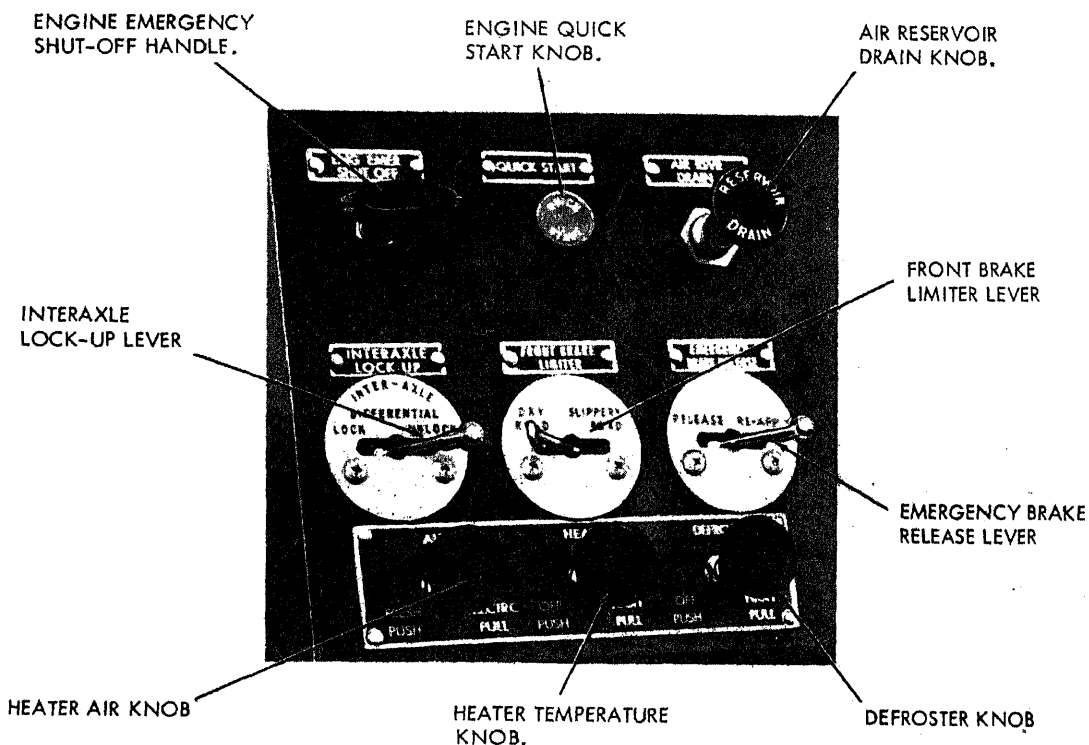
2-9. Controls and Instruments

The purpose of controls and instruments and their normal and maximum readings are illustrated in figure 2-4.



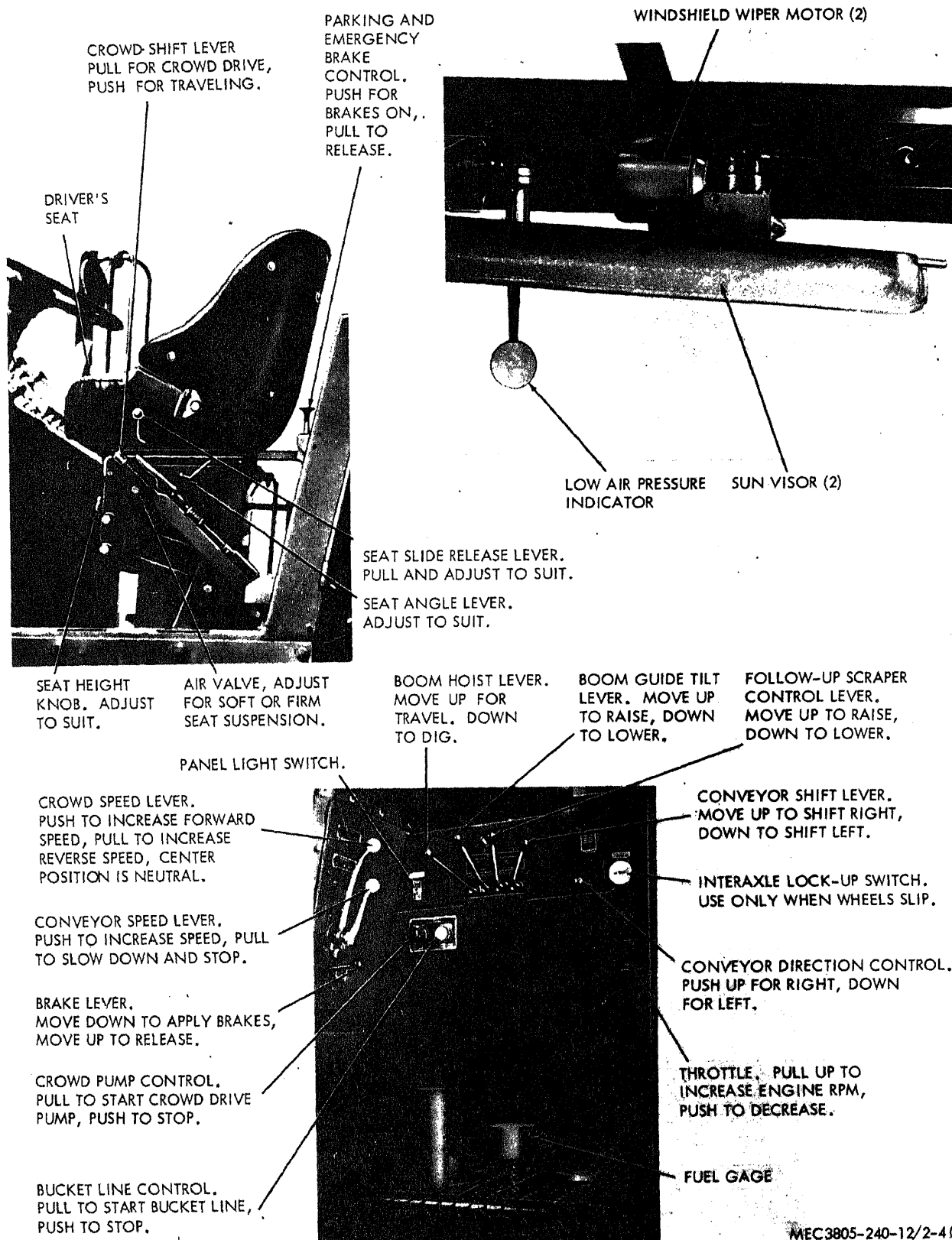
MEC3805-240-12/2-4 ①

Figure 2-4(1). Instruments and controls.



MEC3805-240-15/2-4②

Figure 2-4(2)—Continued.



MEC3805-240-12/2-4 ③

Figure 2-4(3)—Continued.

2-10. General

a. Instructions in this section are published for information and guidance of personnel responsible for operation of the ditching machine.

b. The operator must know how to perform every operation of which the ditcher is capable. This section gives information on starting and stopping the ditcher, basic motions of the ditcher, and on coordinating basic motions to perform specific tasks for which the equipment is designed. Since nearly every job presents a different problem, the operator may have to vary given procedures to fit the individual job.

2-11. Starting

a. Preparation for Starting.

(1) Perform necessary daily preventive maintenance services (para 3-6).

(2) Be sure emergency shutdown valve in engine air inlet housing is latched open.

(3) Push engine shut-off handle all the way in.

(4) Place transmission gear shift lever in neutral.

(5) Place crowd shift lever in travel (forward) position.

b. *Starting.* Refer to figure 2-5 and start the ditching machine.

2-12. Stopping

a. Refer to figure 2-6 and stop the ditching machine.

b. Perform the necessary daily preventive maintenance services (para 3-6).

2-13. Operation Under Usual Conditions

a. General.

(1) The ditching machine is used to dig a trench 24 inches wide to a maximum depth of 6 feet.

(2) The digging cycle consists of four operations: placing the boom in the digging position, operating the bucket line, operating the spoil conveyor, and placing the ditcher in crowding operation.

(3) The term traveling designates moving the machine without digging. The slow speed used for digging is referred to as crowding speed.

(4) The followup scraper which drags behind the bucket cleans and smooths the bottom of the trench.

(5) The bucket line is protected by the overload release clutch which slips when an overload occurs on the bucket line and is automatically re-engaged when bucket line is free from obstacles.

Note. When this condition occurs, it may be necessary to reverse direction of the ditching machine to free the bucket line. Slowing the crowding speed will also aid this condition.

b. Traveling.

(1) Start the engine (para 2-11).

(2) Travel the ditching machine in the numerical sequence as instructed on figure 2-7.

(3) Before driving down steep hills select a gear low enough to insure good control of the machine and to avoid overspeeding the engine and excessive brake wear.

(4) To protect against engine overspeeding, the shift lever can not be down-shifted at speeds greater than these: 6th gear to 5th-20 mph, 5th to 4th-15 mph, 4th to 3rd-10 mph, 3rd to 2nd-7.5 mph, 2nd to 1st-5 mph, neutral to reverse-stop, idle at 550 rpm.

(5) For night travel, lower the followup scraper completely so the red clearance light on the conveyor housing can be seen clearly from the rear.

c. Operating the Boom.

(1) The hydraulic-power boom guide assembly can be tilted into either travel position (lock pins lower position) or digging position (lock pins upper position). When in digging position the boom can be raised or lowered for various depths up to 6 feet. Boom safety lock pins prevent accidental lowering when in travel position.

(2) Operate the boom in the numerical sequence as instructed on figure 2-8.

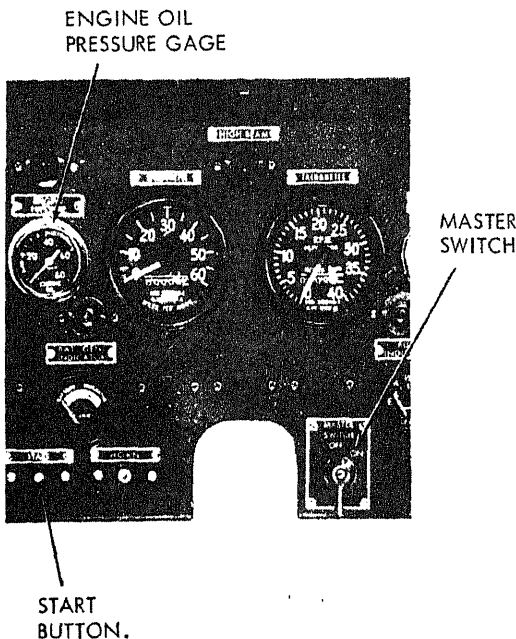
d. Operating the Bucket Line.

(1) The bucket line is designed so that as the buckets go over the head sprocket the material is deposited onto the spoil conveyor which forms a spoil bank beside the trench.

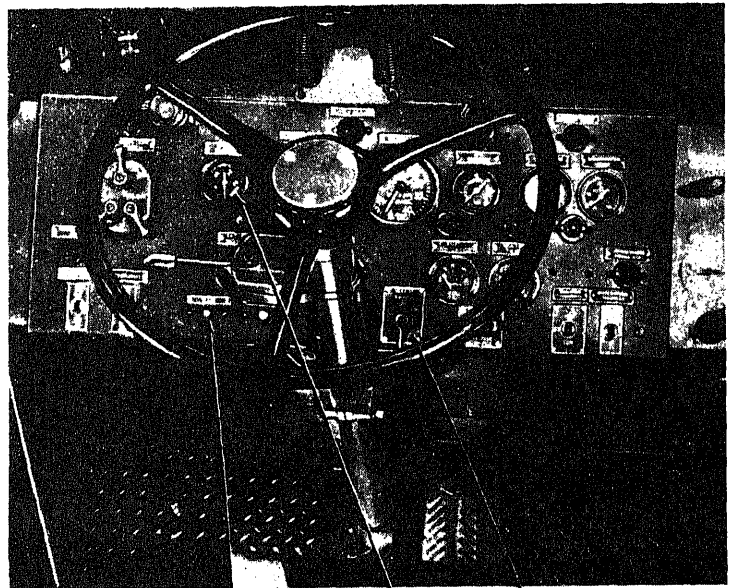
(2) Operate the bucket line in the numerical sequence as instructed on figure 2-9.

(3) For proper gear selection in various soil conditions, refer to (a) through (c) below.

(a) Third gear is used for digging in normal soils. This gear, which gives a higher bucket line speed, provides better delivery to the conveyor in cases where the soil tends to travel with the bucket-line. Tacky soils tend to carry on around; dry, dusty soils tend to spill back.



CAUTION: DO NOT CRANK ENGINE LONGER THAN 30 SECONDS WITHOUT ALLOWING A FEW MINUTES FOR COOLING. IF ENGINE DOES NOT START AFTER A FEW TRIES, STOP CRANKING AND DETERMINE CAUSE, CORRECT OR REPORT CONDITION TO ORGANIZATIONAL MAINTENANCE.



2. PUSH THE START BUTTON UNTIL ENGINE STARTS.

1. TURN ON THE MASTER SWITCH.

3. WATCH THE ENGINE OIL PRESSURE GAGE IMMEDIATELY AFTER STARTING. IF NO OIL PRESSURE IS INDICATED WITHIN 10 TO 15 SECONDS, STOP THE ENGINE AND CHECK THE LUBRICATION SYSTEM.

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Figure 2-5. Starting the ditching machine.

(b) Second gear is used in rocky soils or where obstructions are frequently encountered.

(c) First gear is used where still slower speed is desirable to handle stones or only to open the ditch.

e. Operating Spoil Conveyor.

(1) The conveyor can be set to discharge to either side and can be positioned to place the material where desired.

(2) Operate the spoil conveyor in the numerical sequence as instructed on figure 2-10.

f. Crowding.

(1) Place the ditching machine in crowding operation in the numerical sequence as instructed on figure 2-11.

(2) To stop the crowding operation, reverse the numerical sequence as illustrated on figure 2-11 with one exception: Reverse the direction of the crowd drive pump a few revolutions before placing the crowd speed lever in neutral to relieve strain on the crowd drive gears.

ditions or intended use of the trench requires a clean bottom, with loose dirt removed.

(2) Operate the followup scraper in the numerical sequence as instructed on figure 2-12.

Caution: When use of scraper is required, it must NOT be lowered into position until sufficient length of ditch has been dug to allow scraper to swing down.

h. Digging the Trench.

(1) Position the auxiliary seat to digging station (fig. 2-8).

(2) Start the engine and maneuver the ditching machine into position so that the boom can be lowered at the starting point.

(3) Shift the transmission shift lever in the cab to third gear until soil is known or depth is established and place transfer case shift lever in NEUTRAL position.

(4) Lock the steering brake as instructed on figure 2-13.

(5) Tilt the boom guide to DIGGING posi-

6. TURN OFF MASTER SWITCH.

5. RUN ENGINE AT IDLE SPEED FOR FOUR OR FIVE MINUTES THEN PULL OUT ENGINE SHUT-OFF HANDLE TO STOP ENGINE.

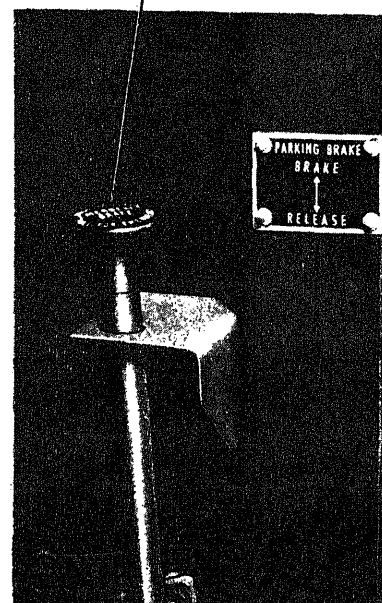
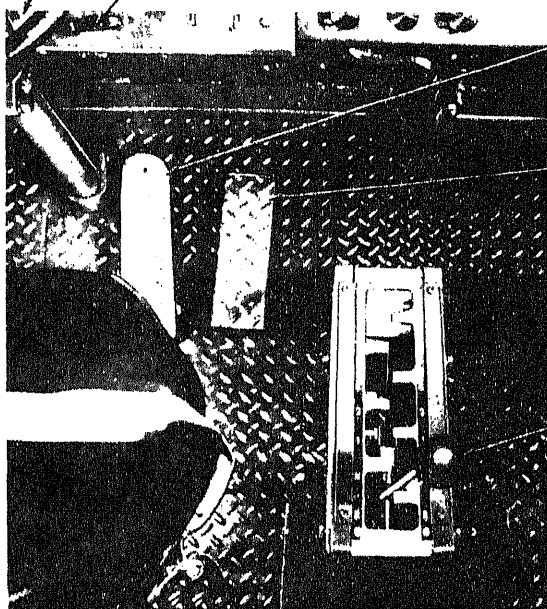
CAUTION: NEVER USE EMERGENCY SHUT-OFF SYSTEM EXCEPT IN AN EMERGENCY.

2. DEPRESS BRAKE PEDAL TO STOP

1. RELEASE ACCELERATOR PEDAL.

3. MOVE TRANSMISSION SHIFT LEVER TO NEUTRAL.

4. PULL TO APPLY PARKING BRAKE.



MEC3805-240-12/2-6

Figure 2-6. Stopping the ditching machine.

(7) Lower the boom slowly until the bucket line is close to the ground.

(8) Set the spoil conveyor from the operator's side if possible. See *e* above.

(9) Open the hand throttle to three-quarter full open, and continue to lower the boom slowly until desired depth is reached as indicated by the digging depth indicator.

(10) Place machine in crowding operation as in *f* above.

(11) After the machine has progressed a number of feet, the operator should be accustomed to the normal sound and feel of the machine. The most efficient digging is a result of the proper combination of crowding and bucket line speeds.

Note. If digging gets harder and engine starts to labor, retard the crowd lever slightly to reduce forward motion. The forward motion should never be more than the engine can handle without laboring.

(12) Lower the followup scraper if desired as in *g* above.

i. Digging Trench in Muddy Soil.

(1) *Loss of traction.*

(a) Move interaxle lock-up lever to the lock position.

(b) Place planks under the wheels to increase traction on muddy, slippery ground.

(c) Deflate the tires to a minimum of 2½ psi to increase traction.

(2) *Keeping bucket line clean.*

(a) Operate the bucket line at the highest operating speed feasible for the condition of the soil, to keep the buckets clear of packed mud.

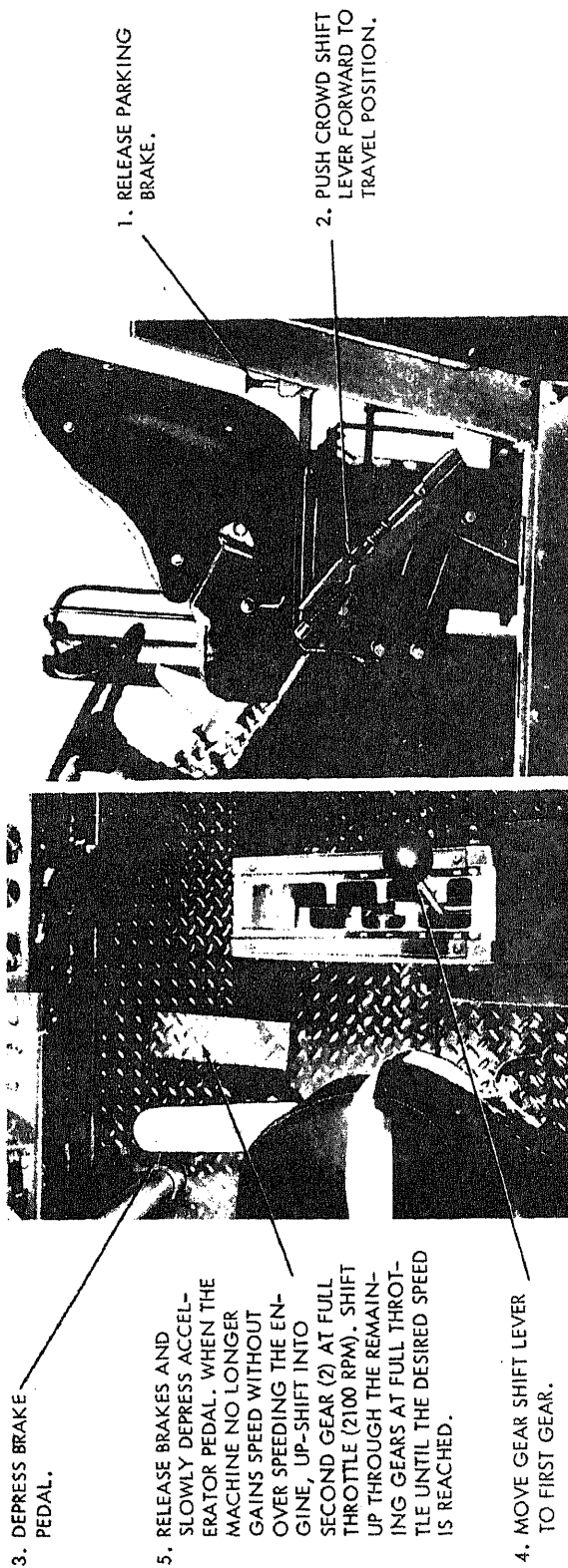
(b) Use a slow crowding speed. High crowding speed causes mud to pack tightly in the bucket.

(c) If bucket line packs, stop forward speed and raise boom out of the ditch and spin the bucket line for a short time. This will usually dislodge material.

(d) When finishing a cut, always spin the bucket line and run the conveyor to throw out clinging mud before it dries on the machine.

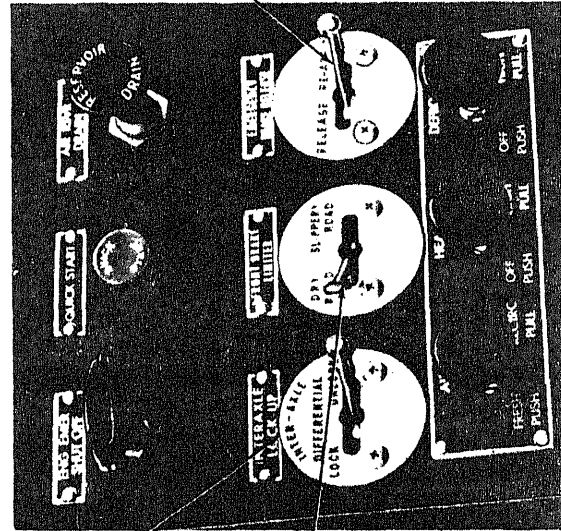
(e) Remove the mud from all parts of the machine, giving particular attention to the outside of the boom.

(f) Thoroughly clean mud from the conveyor belt and flashing.



6. IF THE WHEELS SPIN, MOVE THE INTERAXLE LOCK-UP LEVER TO "LOCK". WHEN GOOD TRACTION IS REGAINED, MOVE THE LEVER BACK TO "UNLOCK".
7. THE TENDENCY TO SKID WHEN BRAKING ON SLIPPERY ROADS CAN BE REDUCED BY MOVING THE FRONT BRAKE LIMITER LEVER FROM "DRY ROAD" TO "SLIPPERY ROAD".

CAUTION:
THIS CONTROL REDUCES THE BRAKING FORCE ON THE FRONT WHEELS. USE ONLY AS REQUIRED ON SLIPPERY ROADS.

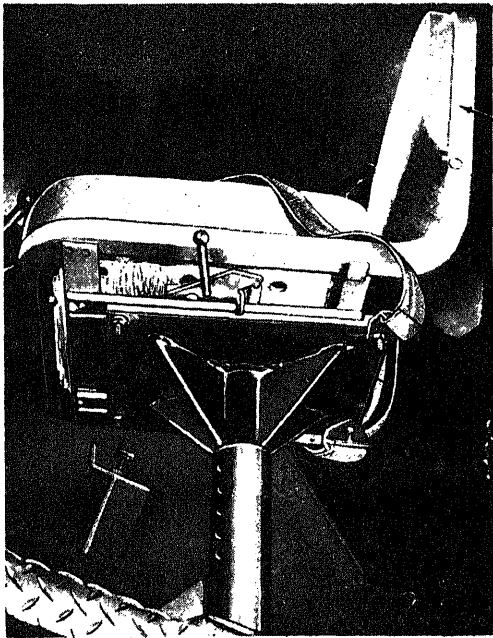


8. LOSS OF OPERATING AIR PRESSURE WILL CAUSE THE BRAKES TO BE APPLIED AUTOMATICALLY. TO RELEASE BRAKES FOR EMERGENCY TOWING OR DRIVING, MOVE THE EMERGENCY BRAKE RELEASE LEVER TO "RELEASE." AIR FROM AN EMERGENCY RESERVOIR WILL NOW RELEASE THE BRAKES. MOVE THE LEVER BACK TO "RE-APPLY."

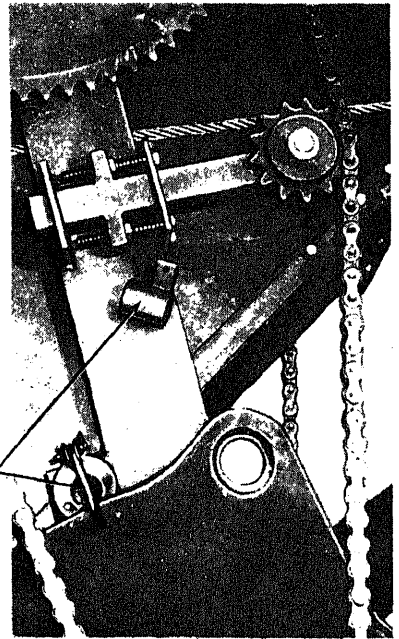
WARNING: THIS LEVER MUST ALWAYS BE IN THE "RE-APPLY" POSITION EXCEPT AS INSTRUCTED ABOVE. OTHERWISE, IF AIR PRESSURE FAILS, THE BRAKES WILL NOT BE APPLIED AUTOMATICALLY. THIS CAN CAUSE LOSS OF CONTROL, RESULTING IN POSSIBLE MACHINE DAMAGE AND INJURY TO PERSONNEL.

Figure 2-7. Traveling details.

1. START THE ENGINE
(PARA 2-11).



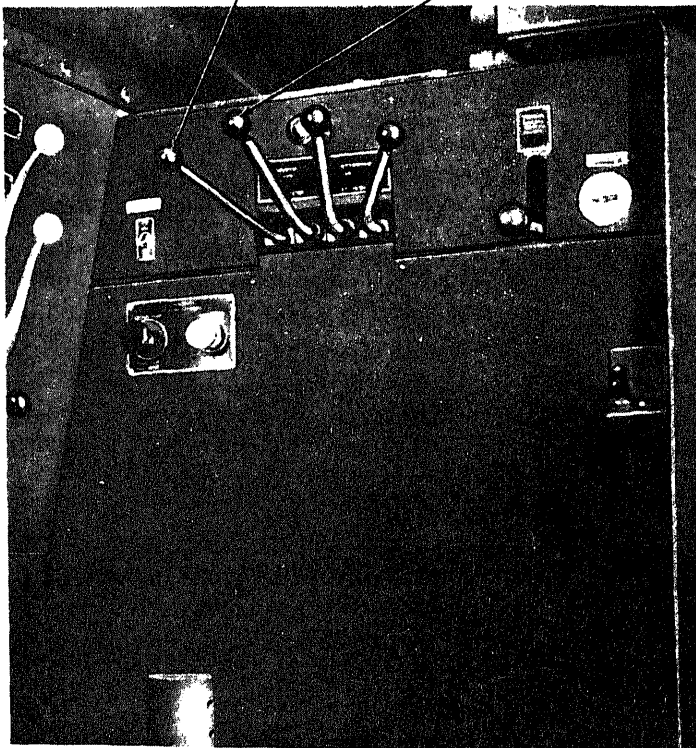
2. MOVE OPERATOR'S SEAT
TO DIGGING STATION.



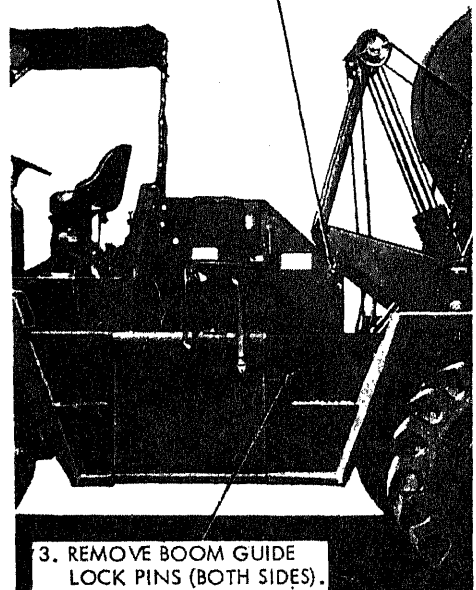
6. REMOVE BOTH LOCK PINS
(BOTH SIDES) AND SECURE
THEM WITH THE KEEPER PINS
IN HOLDERS ON SPREADER
ARMS.

7. MOVE BOOM HOIST LEVER
DOWN TO LOWER BOOM
TO TRENCH DEPTH; MOVE
LEVER UP TO RAISE BOOM.

4. MOVE BOOM TILT LEVER
DOWN TO LOWER BOOM
GUIDE INTO DIGGING
POSITION. MOVE LEVER
UP TO RAISE BOOM GUIDE
FOR TRAVEL.



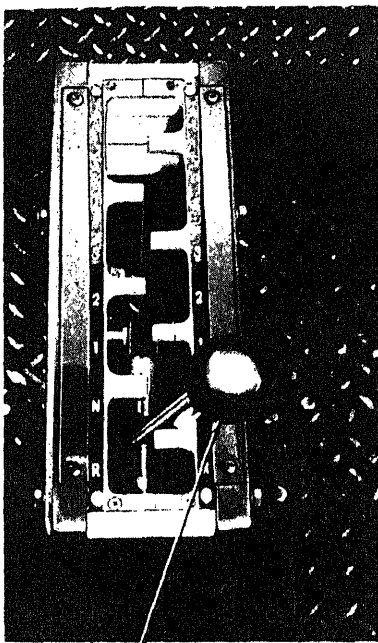
5. LOCK BOOM GUIDE IN DIGGING
POSITION (BOTH SIDES).



3. REMOVE BOOM GUIDE
LOCK PINS (BOTH SIDES).

MEC3805-240-12/2-8

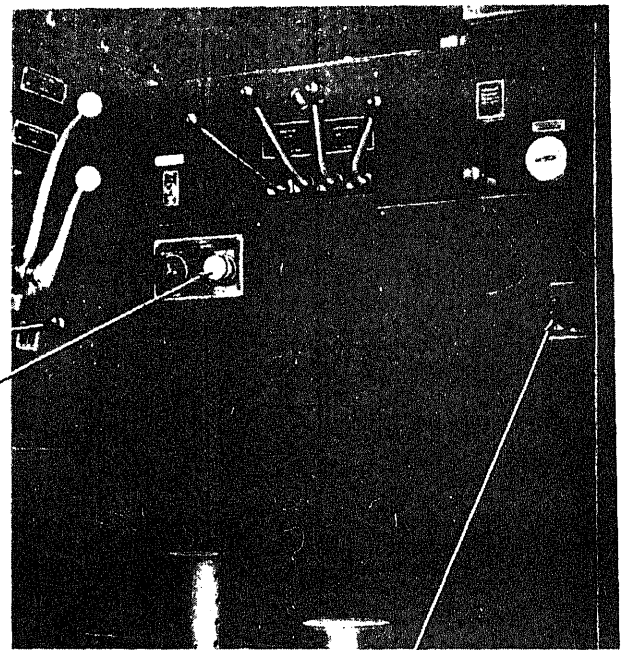
Figure 2-8. Operating the boom.



2. MOVE TRANSMISSION SHIFT LEVER FOR DESIRED BUCKET LINE SPEED AS SHOWN BELOW:
- 1st GEAR - 180 FPM
 - 2nd GEAR - 255 FPM
 - 3rd GEAR - 360 FPM

1. START THE ENGINE (PARA. 2-11).

3. PULL OUT THE BUCKET LINE CONTROL KNOB TO START THE BUCKET LINE. PUSH KNOB IN TO STOP.



4. BUCKET LINE SPEEDS ARE DETERMINED WITH THROTTLE AT MAXIMUM GOVERNED SPEED - 2100 RPM. ADJUST WITH HAND THROTTLE AS REQUIRED.

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Figure 2-9. Operating the bucket line.

j. Digging Rock Formation.

(1) Use a slow bucket line speed and a very slow crowding speed to dig in most rock formations so as to mill out the rock at a slow, deliberate pace. This will reduce wear and tear on the machine.

(2) Keep close watch on the bucket teeth because they take a severe pounding and wear out at the highest rate in this type of digging.

k. Digging on a Slope.

(1) The ditching machine should be kept at a level, lateral keel, if possible, to prevent twisting of the boom.

(2) Do not exceed 10° (17.5 percent) incline on a side slope at any time.

(3) Do not exceed 12° (21 percent) grade for uphill digging.

(4) Do not exceed 15° (27 percent) grade for downhill digging.

l. Cutting at Right Angle.

(1) Right angle cuts from a previously cut trench may be made if care is taken.

(2) Back up to the existing trench to the point where the boom can be lowered.

Caution: Exercise care in positioning ditching machine. Backing the machine too close to the existing trench will cause a cave-in.

(3) If necessary, use planking over the original trench for added support.

m. Encountering Immovable Obstruction.

(1) When an immovable obstruction is encountered and the bucket line continues to stop, this indicates that the object encountered is too large to move, or may require special handling.

(2) Stop crowding the ditching machine and back away slightly.

(3) Then crowd slowly and raise the boom simultaneously a few inches at a time with the boom hoist control lever, in an effort to locate the top of the obstruction. Cut across the top and down the opposite side of the obstruction until the desired depth is reached.

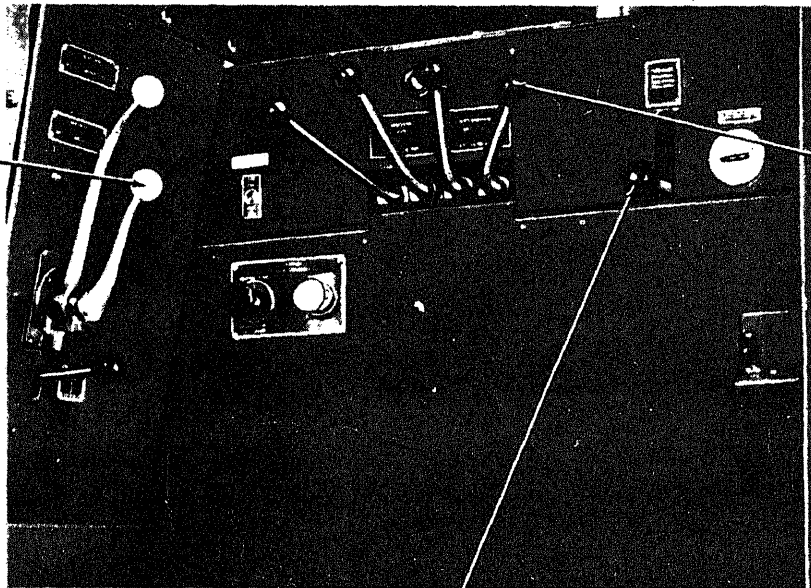
(4) After performing the operation above, the obstruction now has space into which it can be dislodged, or space for easier hand removal.

n. Encountering Underground Obstructions.

(1) If a rock or other obstruction is en-

1. START THE ENGINE (PARA. 2-11).

4. PUSH CONVEYOR SPEED LEVER FORWARD TO START CONVEYOR AND REGULATE SPEED. TO INCREASE SPEED PUSH LEVER FORWARD. TO SLOW DOWN AND STOP, PULL LEVER BACK.



3. MOVE CONVEYOR SHIFT LEVER UP TO MOVE CONVEYOR OVER TO THE RIGHT, MOVE LEVER DOWN TO MOVE CONVEYOR TO THE LEFT, AS DESIRED.

2. MOVE CONVEYOR DISCHARGE LEVER UP TO DISCHARGE SPOIL ON RIGHT SIDE OF DITCHER, OR DOWN TO DISCHARGE ON LEFT SIDE. IT IS GENERALLY BEST TO DISCHARGE AWAY FROM THE OPERATOR'S SIDE IF POSSIBLE.

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Figure 2-10. Operating the spoil conveyor.

countered underground and the engine continues to pull and the bucket line begins to slip through action of the release clutch, immediately stop crowding by pulling the crowd lever to the neutral position, then move the lever to the reverse position to reverse the ditching machine.

(2) Stop reversing the machine when the bucket line frees itself and starts turning.

(3) Throttle down the engine to approximately idle speed with the hand throttle control handle while reversing the machine.

(4) Gradually increase the engine speed with hand throttle control while proceeding forward again at a reduced crowding speed, feeling for the obstruction and attempting to tear it loose without stopping the bucket line.

Note. If bucket line stops again, proceed with instructions outlined in *m* above.

2-14. Operation in Extreme Cold

a. Cooling System.

(1) Fill the cooling system with the proper antifreeze solution. Before adding initial antifreeze mixture, clean and flush the entire cooling

system. Never flush a cold system in cold weather.

(2) Check frequently for leaks and hose deterioration.

(3) Check the fan belts daily as cold weather will cause them to become stiff and break more frequently.

b. Lubricating System.

(1) Lubricate the unit for cold-weather operation in accordance with current lubrication order.

(2) When temperature reaches 32°F or below, it is necessary to warm up the hydraulic system fluid as follows:

(a) Let engine idle until warmed up to operating temperature and remove lock pins on the digging boom and followup scraper assemblies.

(b) Be sure transmission and crowd drive shift levers are in neutral.

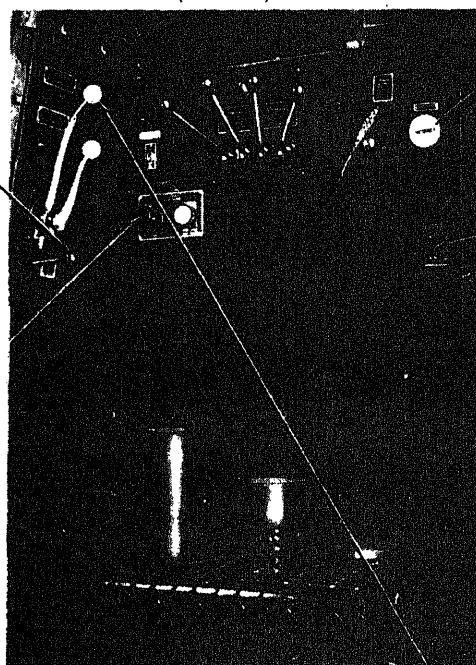
(c) Run engine at 1,100 to 1,200 rpm.

(d) Pull crowd pump control knob (fig. 2-4); push crowd speed lever forward and run crowd drive motor.

1. START THE ENGINE (PARA. 2-11).
RUN ENGINE AT IDLE SPEED (550 RPM).

6. RELEASE PARKING BRAKES.

4. PULL OUT CROWD PUMP KNOB TO START CROWD PUMP.



7. PUSH CROWD SPEED LEVER FORWARD TO START MACHINE MOVING FORWARD AND TO INCREASE SPEED. PULL LEVER BACK TO SLOW DOWN, STOP (NEUTRAL), AND REVERSE THE MACHINE.

NOTE: IF WHEELS SPIN, MOVE INTERAXLE LOCK-UP LEVER TO "LOCK". WHEN GOOD TRACTION HAS BEEN REGAINED, MOVE LEVER BACK TO "UNLOCK".

5. PULL THROTTLE HANDLE TO INCREASE ENGINE SPEED.

2. PULL CROWD SHIFT LEVER BACK TO CROWD DRIVE POSITION.

3. APPLY THE PARKING BRAKES.

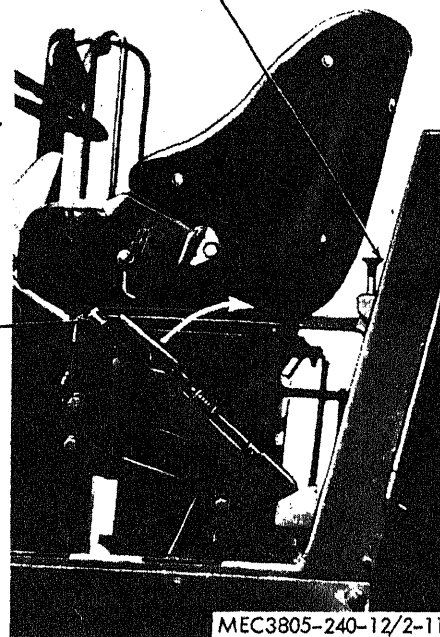


Figure 2-11. Crowding.

(e) Push up on conveyor direction control lever. Push conveyor speed lever and run conveyor belt drive motors. At the same time, operate the conveyor shift lever and move the conveyor from left to right four times, then center conveyor.

(f) Operate the followup scraper control lever to lower and raise the scraper four times.

(g) Move crowd speed lever to neutral and push in the crowd pump control knob.

(h) Pull conveyor speed lever to stop conveyor.

(i) Operate boom hoist lever to lower boom to ground and fully raise boom four times.

(j) Install lock pins on digging boom and followup scraper.

(k) Inspect hydraulic components for leaks after each warm-up. Tighten, repair or replace faulty components.

c. *Fuel System.* Water or ice in the fuel system will cause trouble in cold weather. To keep water out of the fuel system, observe the following instructions:

(1) Keep the diesel fuel tank full at all times, to prevent condensation.

(2) Drain the filters and tank more often than under normal conditions.

(3) Keep the tank filler cap and screen free from ice and snow at all times.

d. *Electrical System.*

(1) Do not disturb electrical leads or wiring as insulation becomes brittle when cold.

(2) Make sure the batteries are fully charged. A partially charged battery may freeze and crack the cells. Run the engine for at least 1 hour after adding water to batteries during freezing weather.

e. *Digging Trench in Frozen Ground.* When digging through frozen ground, the same procedure will be used as described in paragraph 2-13j, except that third gear will be used with a slow-crowding speed.

f. *Care of Bucket Line and Conveyor.*

(1) When finishing a cut, always spin the bucket line and operate the conveyor to throw out any material which may freeze to the parts of the machine.

1. START THE ENGINE (PARA 2-11).

2. REMOVE SCRAPER KEEPER PINS (BOTH SIDES).

3. MOVE SCRAPER BLADE LEVER DOWN TO LOWER SCRAPER INTO DITCH.



NOTE: WHEN THE SCRAPER HAS LOWERED ABOUT 80°, THE OUTER SLIDE MEMBER IS AUTOMATICALLY UNLATCHED AND ROLLS DOWN INTO POSITION.

4. MOVE SCRAPER BLADE LEVER UP TO RAISE THE SCRAPER. WHEN FULLY RAISED, PUSH THE OUTER SLIDE MEMBER TOWARD THE DITCHER UNTIL THE LATCH RE-ENGAGES AND THE KEEPER PINS CAN BE INSTALLED.

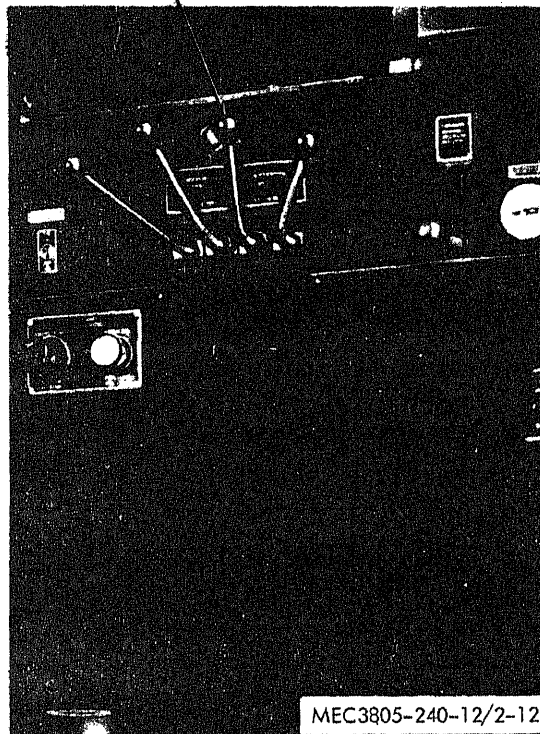


Figure 2-12. Followup scraper, operating details.

(2) Remove frozen material from all parts the machine, giving particular attention to the side of the boom.

(3) Thoroughly clean all material from the conveyor belt and flashing.

-15. Operating in Extreme Heat

a. Cooling System.

(1) Check the coolant level frequently. Clean and flush the cooling system at frequent intervals.

(2) Make sure the fan belts are in good condition, that belt tension is adjusted properly, and that thermostats are in proper working condition.

(3) Clean between fins of the radiator core frequently to get best possible cooling. Use compressed air, if available, to blow all dust and dirt out of the core. Avoid using water that contains substances likely to cause excessive scale and rust in the cooling system.

b. Lubrication System. Lubricate the unit for hot-weather operation in accordance with current lubrication order.

c. Fuel System.

(1) Clean the fuel strainer frequently and check the fuel filter more often than is required during normal operation.

(2) Check the air cleaner. Keep it clean and free from foreign matter.

d. Electrical System. Check the electrolyte level in the batteries daily, and fill to three-eighths inch above plate level with pure, distilled water, if available. Otherwise, use mineral-free, clean water.

2-16. Operation in Dusty or Sandy Areas

a. Cooling System.

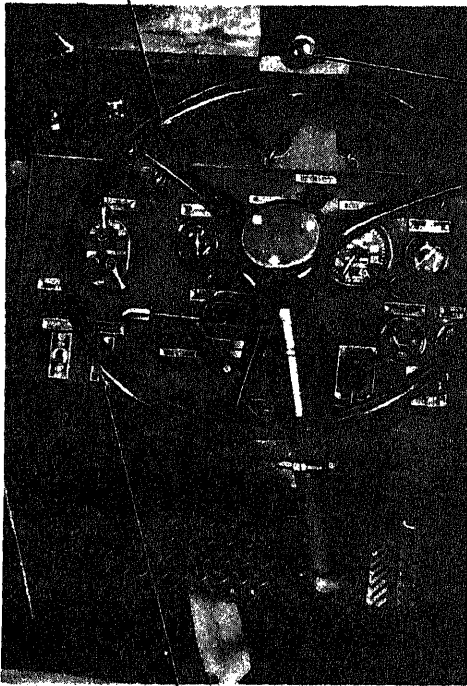
(1) Keep the radiator core free of dust, sand, or foreign matter to avoid overheating of the engine.

(2) Keep dust and sand from entering the radiator by wiping dust or sand from cap before adding coolant.

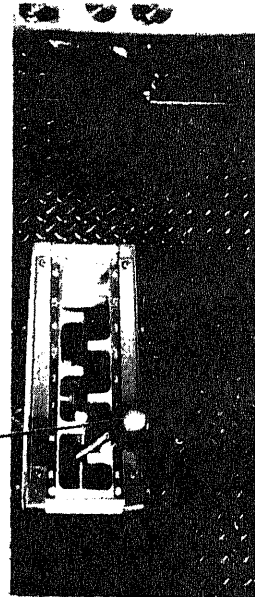
b. Lubrication System.

(1) Lubricate the unit in accordance with current lubrication order.

1. MOVE STEERING WHEEL TO THE DESIRED POSITION FOR DIGGING.



2. PULL STEERING BRAKE LEVER TO ENGAGE BRAKE.

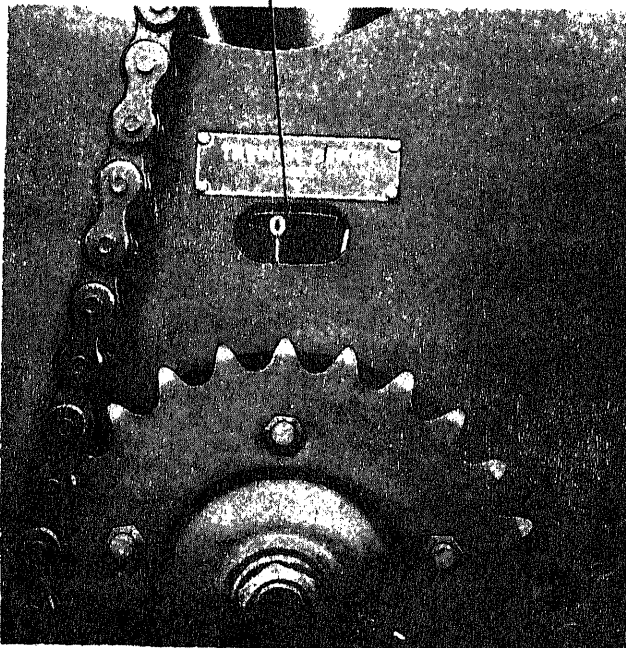


3. CAUTION: DO NOT SHIFT ABOVE THIRD GEAR WHEN DIGGING.

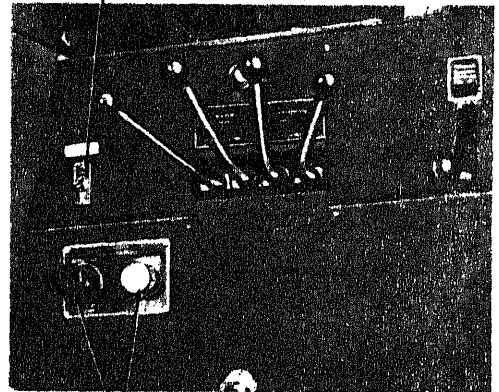


6. TURN ON FLOODLIGHT SWITCH FOR NIGHT-TIME DIGGING.

4. CHECK DIGGING DEPTH ON GAGE.



5. TURN ON PANEL LIGHT SWITCH FOR NIGHT-TIME DIGGING.



7. IN EMERGENCY PUSH IN BOTH THE CROWD PUMP AND BUCKET LINE CONTROL KNOBS. CROWDING AND BUCKET LINE MOVEMENT WILL STOP IMMEDIATELY.

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Figure 2-18. Digging details.

(2) Keep all lubrication points clean and avoid spilling oil on the unit as it will collect dust and sand.

(3) Clean and replace filters more often than in normal operation.

c. Fuel System.

(1) Take all precautions necessary to keep grit out of the fuel tank and fuel system. Clean the filter and strainer frequently.

(2) Check and service the air cleaner as necessary.

d. Electrical System.

(1) Service the batteries frequently and keep battery box covers securely fastened.

(2) If any of the instrument gages have loose-fitting glass, use a sealer or tape to keep dust or sand from entering.

e. Digging Trench in Sandy or Dusty Soils.

(1) Few special procedures are needed to operate the ditching machine in dusty or sandy soils. The bucket line should be operated at higher speeds, such as third gear, to prevent spillback of the soil from the buckets.

(2) Exercise care to prevent cave-ins of the trench, and to prevent the ditching machine from slipping into an open trench.

(3) The tires may be partially deflated to a minimum of 25 psi to increase traction in loose soil.

2-17. Operation Under Rainy or Humid Conditions

a. Lubrication System.

(1) Lubricate the unit.

(2) Keep the filler caps and plugs tight. Prevent water from entering the lubrication system while servicing.

b. Fuel System.

(1) Keep the fuel tank full to avoid condensation of moisture, and keep fill caps tight.

(2) Inspect filter and strainer for accumulated water more often than is required during normal operation.

c. Electrical System.

(1) Check wiring for cracked or frayed insulation. See that wiring is kept dry and water-proofed.

(2) Coat the battery terminals with grease, and keep the battery box cover secured.

d. Protection.

(1) Cover the ditching machine with a tarpaulin or similar protection when unit is not in operation.

(2) Remove cover during dry periods. Open covers to allow unit to dry before operating.

2-18. Operation in Salt-Water Areas

a. Lubricating System.

(1) Keep all filler caps and plugs tight.

(2) Be sure to clean and dry all fittings before lubricating.

b. Cooling System.

(1) Except in cases of extreme emergency, salt water should not be used in the cooling system.

(2) When it has been necessary to use salt water, drain and flush the system and fill with fresh water as soon as possible.

c. Electrical System.

(1) Clean electrical connections and keep them dry.

(2) Coat the battery terminals with grease and secure battery cover.

d. Protection.

(1) Wash the unit frequently with clean, fresh water.

(2) Remove corrosion from any unpainted surface. Report areas in need of painting to organizational maintenance.

2-19. Operation at High Altitude

a. Above 5,000 feet engine efficiency will be reduced. This is a normal condition which cannot be prevented, but maximum performance can be maintained by following all service instructions carefully.

b. Be sure air cleaners are clean and free of objects that might restrict flow of air to the unit.

c. Be alert for radiator pressure leaks which allow the coolant to boil with resultant loss of coolant.

d. Inspect the radiator cap and gasket frequently for tight sealing.

Section V. OPERATION OF AUXILIARY MATERIEL USED IN CONJUNCTION WITH THE DITCHING MACHINE

2-20. Heater

a. General. The heater supplies the necessary quantities of heated air to maintain warmth in the

cab compartment. This heater is designed to operate on water from the engine cooling system. Operation of the heater is controlled by manual buttons and a blower switch.

b. Operation.

(1) Perform the daily preventive maintenance services.

(2) Operate the heater as instructed on figure 2-14.

2-21. Fire Extinguisher (Carbon Dioxide Type)

a. Description. The carbon dioxide type fire extinguisher is suitable for electrical and flammable liquid fires. The carbon dioxide types are in 5-pound, 7 1/2 pound, and 10-pound sizes. The 5-pound extinguisher is portable; the other two are fixed type.

b. Operation. Remove fire extinguisher from its location; break seal, operate control valve, and direct stream at base of the flame.

c. Maintenance. For maintenance of the fire extinguisher, refer to TB 5-4200-200-10.

2-22. Cold-Weather Starting Aid

a. General. When the outside temperature is low, it may be necessary to use starting fluid to assist ignition of the fuel.

Caution: The starting aid is *not* intended to correct for low batteries, heavy oil, or other

conditions which cause hard starting. Use it only when other conditions are normal, but the air temperature is too cold for the heat of compression to ignite the fuel-air mixture.

b. Refer to figure 2-15 and start the engine.

Caution: Do not crank the engine more than 30 seconds at a time. Allow one minute intervals between cranking attempts to cool the starting motor.

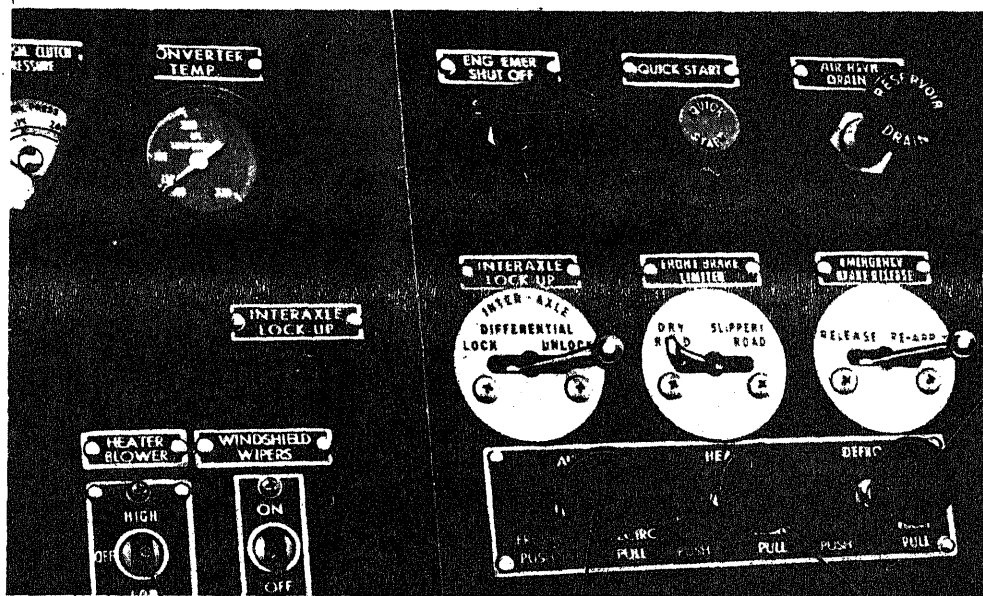
2-23. Cab Canvas and Frame Assembly

a. General. A canvas top, side curtains, and a rear curtain are provided to enclose the operator's cab. The frame assembly consists of three tubular steel members and three wooden roof staves. In warm weather the canvas and frame assembly can be rolled up and stored behind the seats in the cab. The top and rear curtain can be used without the side curtains, as a sun shade.

b. Removal and Installation. Refer to figures 2-16 and 2-17 for removal and installation instructions.

c. Storage. Refer to figure 2-18 for storage instructions.

1. START ENGINE (PARA. 2-11).



4. PULL OUT DEFROST KNOB TO DEFROST WINDSHIELD.

3. MOVE HEATER BLOWER SWITCH TO HIGH OR LOW, TO FORCE WARM AIR INTO THE CAB.

5. PULL OUT AIR KNOB TO RECIRCULATE WARM AIR. PUSH AIR KNOB IN FOR WARMED FRESH AIR.

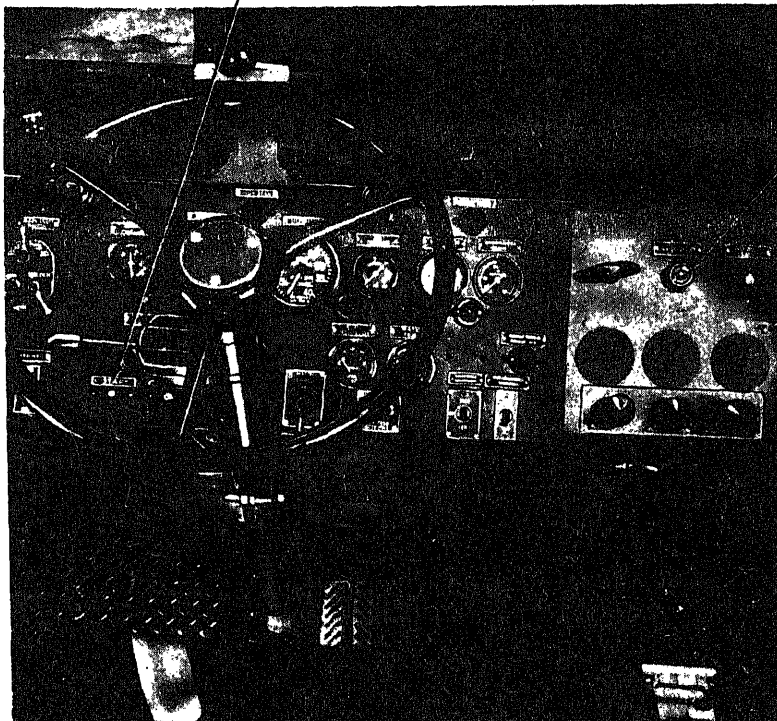
2. WHEN COOLANT REACHES NORMAL OPERATING TEMPERATURE, PULL OUT HEAT KNOB TO THE DESIRED SETTING.

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Figure 2-14. Operating the heater.

2. PUSH ENGINE START BUTTON.

1. REFER TO PARAGRAPH 2-11 AND
PREPARE THE ENGINE FOR STARTING.



3. PULL OUT THE QUICKSTART
BUTTON FOR ONE OR TWO
SECONDS, THEN RELEASE IT.

4. REPEAT THE PROCEDURE IF
THE ENGINE DOES NOT START
ON THE FIRST ATTEMPT.

CAUTION: DO NOT CRANK THE
ENGINE MORE THAN 30 SECONDS
AT A TIME. ALWAYS ALLOW ONE
MINUTE INTERVALS BETWEEN
CRANKING ATTEMPTS TO ALLOW
THE STARTING MOTOR TO COOL.

MEC3805-240-12/2-15

Figure 2-15. Operating the cold-weather starting aid.

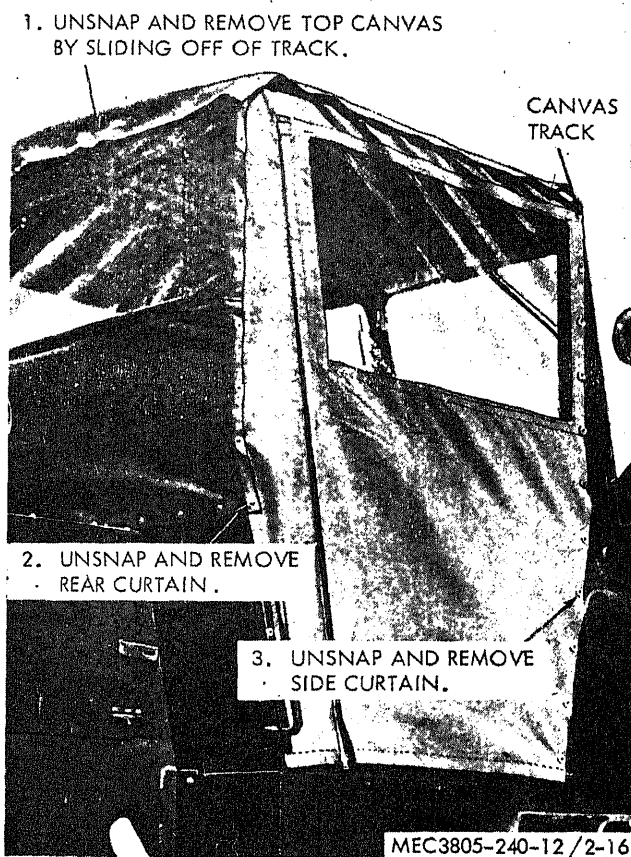


Figure 2-16. Canvas, removal and installation.

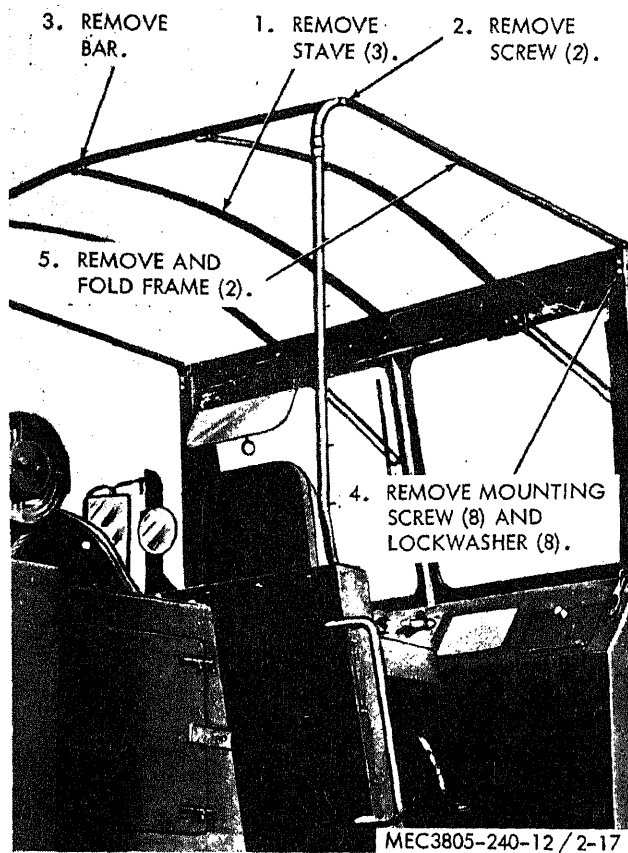
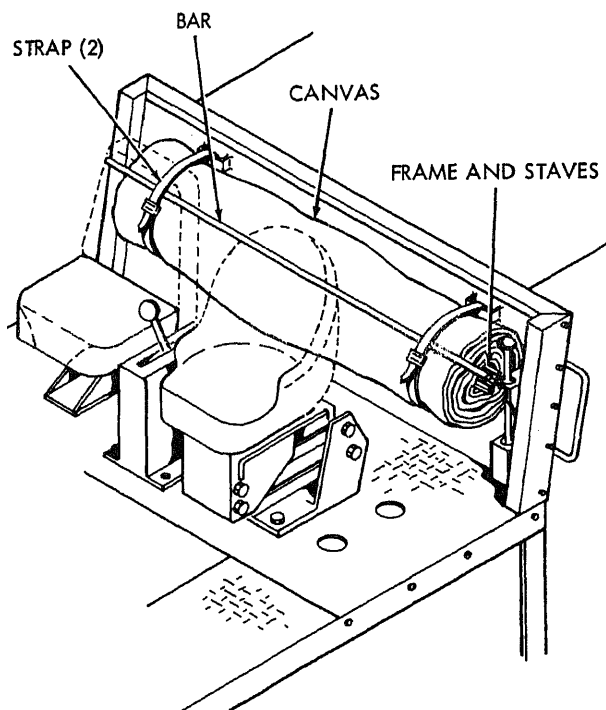


Figure 2-17. Canvas frame, removal and installation.



MEC3805-240-12 / 2-18

Figure 2-18. Canvas storage.

CHAPTER 3

OPERATOR AND ORGANIZATIONAL MAINTENANCE

INSTRUCTIONS

Section I. OPERATOR AND ORGANIZATIONAL MAINTENANCE

TOOLS AND EQUIPMENT

3-1. Special Tools and Equipment

No special tools or equipment are required by operator or organizational maintenance personnel for maintenance of the ditching machine.

3-2. Basic Issue Tools and Equipment

Tools and repair parts issued with or authorized for use with the ditching machine are listed in the Basic Issue Items List, Appendix B of this manual.

Section II. LUBRICATION

3-3. General Lubrication Information

a. This section contains a reproduction of the lubrication order and lubrication instructions which are supplemental to, and not specifically covered in the lubrication order.

b. For the current lubrication order, refer to DA PAM 310-4.

3-4. Detailed Lubrication Information

a. *General.* Keep all lubricants in closed containers and store in a clean, dry place away from external heat. Allow no dust, dirt, or other foreign material to mix with the lubricants. Keep all lubrication equipment clean and ready for use.

b. *Cleaning.* Keep all external parts not requiring lubrication clean of lubricants. Before lubricating the equipment, wipe all lubrication points free of dirt and grease. Clean all lubrication points after lubricating to prevent accumulation of foreign matter.

c. *Points of Lubrication.* Service the lubrication points at proper intervals as illustrated on the current lubrication order.

d. OES Oil.

(1) Crankcase oil level must be checked frequently as oil consumption may increase.

(2) Oil may require changing more frequently than usual because contamination by dilution and sludge formation will increase under cold weather operation conditions.

Figure 3-1. Not used.

Section III. PREVENTIVE MAINTENANCE SERVICES

3-5. General

To insure that the ditching machine is ready for operation at all times, it must be inspected systematically so that defects may be discovered and corrected before they result in serious damage or failure. The necessary preventive maintenance services to be performed are listed and described in paragraphs 3-6 and 3-7. Item numbers indicate the sequence of minimum inspection require-

ments. Defects discovered during operation of the unit shall be noted for future correction, to be made as soon as operation has ceased. Stop operation immediately if a deficiency is noticed which would damage the equipment if operation were continued. All deficiencies and shortcomings will be recorded together with the corrective action taken on DA Form 2404 at the earliest possible opportunity.

3-6. Daily Preventive Maintenance Services

This paragraph contains an illustrated tabulated listing of preventive maintenance services which must be performed by the operator. The item numbers are listed consecutively and indicate the sequence of minimum requirements. Refer to figure 3-2 for the daily preventive maintenance services.

3-7. Quarterly Preventive Maintenance Services

a. This paragraph contains an illustrated tabu-

lated listing of preventive maintenance services which must be performed by organizational maintenance personnel at quarterly intervals. A quarterly interval is equal to 3 calendar months, or 250 hours of operation, whichever occurs first.

b. The item numbers are listed consecutively and indicate the sequence of minimum requirements. Refer to figure 3-3 for the quarterly preventive maintenance services.

Section IV. OPERATOR'S MAINTENANCE

3-8. General

Instructions in this section are published for the information and guidance of the operator to maintain the ditching machine.

3-9. Fuel Tank

Refer to figure 3-4 and service the fuel tank.

3-10. Quick Start Assembly

a. Refer to figure 3-5 and service the quick start assembly.

b. Periodically perform the following service items to assure good performance:

(1) Remove the fluid cylinder and lubricate the valve around the pusher pin under the gasket with a few drops of oil.

(2) Lubricate the actuator cable.

(3) Actuate the valve with the cable to distribute the oil on the cable and allow the oil to run down through the valve.

(4) Remove any dirt from the orifice by removing the air inlet housing fitting, the orifice block and the screen and then blow air through the orifice end only.

(5) Assemble and tighten the air inlet housing fitting to the actuator valve and tube.

(6) Check for leakage of fluid (fogging) on the outside of the engine air inlet housing by actuating the quick start while the engine is stopped. If fogging occurs, disassemble and retighten the air inlet housing fitting to the housing.

Caution: Do not actuate the quick start more than once with the engine stopped. OVERLOADING THE ENGINE AIR BOX WITH THIS HIGH VOLATILE FLUID COULD RESULT IN A MINOR EXPLOSION.

(7) Check the fluid cylinder for hand tightness.

3-11. Cooling System

Refer to figure 3-6 and service the cooling system.

3-12. Alternator Drive Belts

Refer to figure 3-7 and adjust belt tension.

3-13. Transmission

Refer to figure 3-8 and service transmission.

3-14. Air Compressor Belt

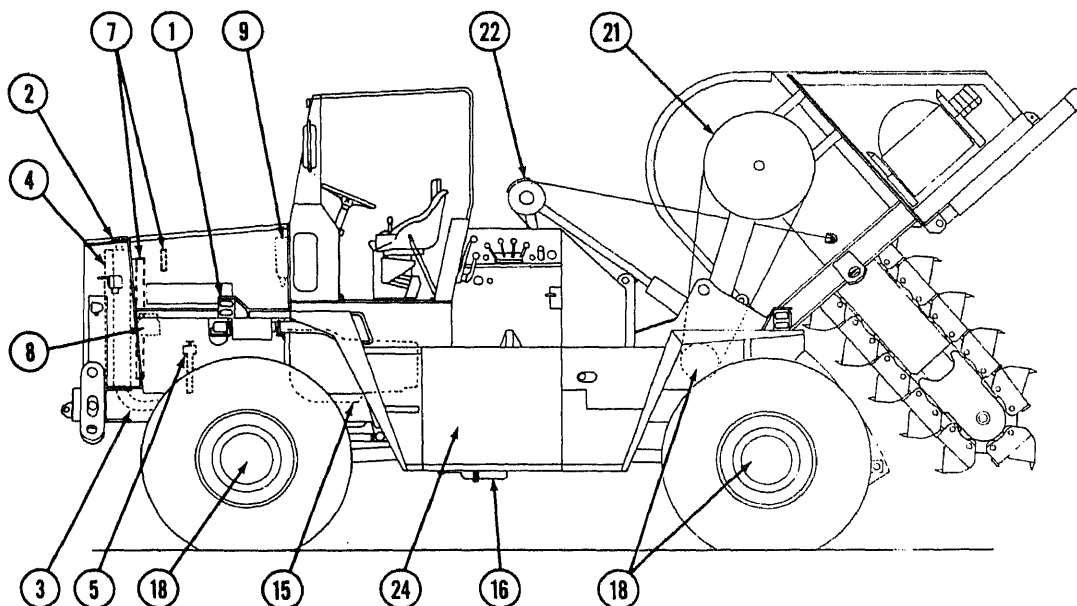
Refer to figure 3-9 and service compressor belt.

PREVENTIVE MAINTENANCE SERVICES QUARTERLY

TM5-3805-240-12

PARSONS MODEL 624 VL

DITCHING MACHINE

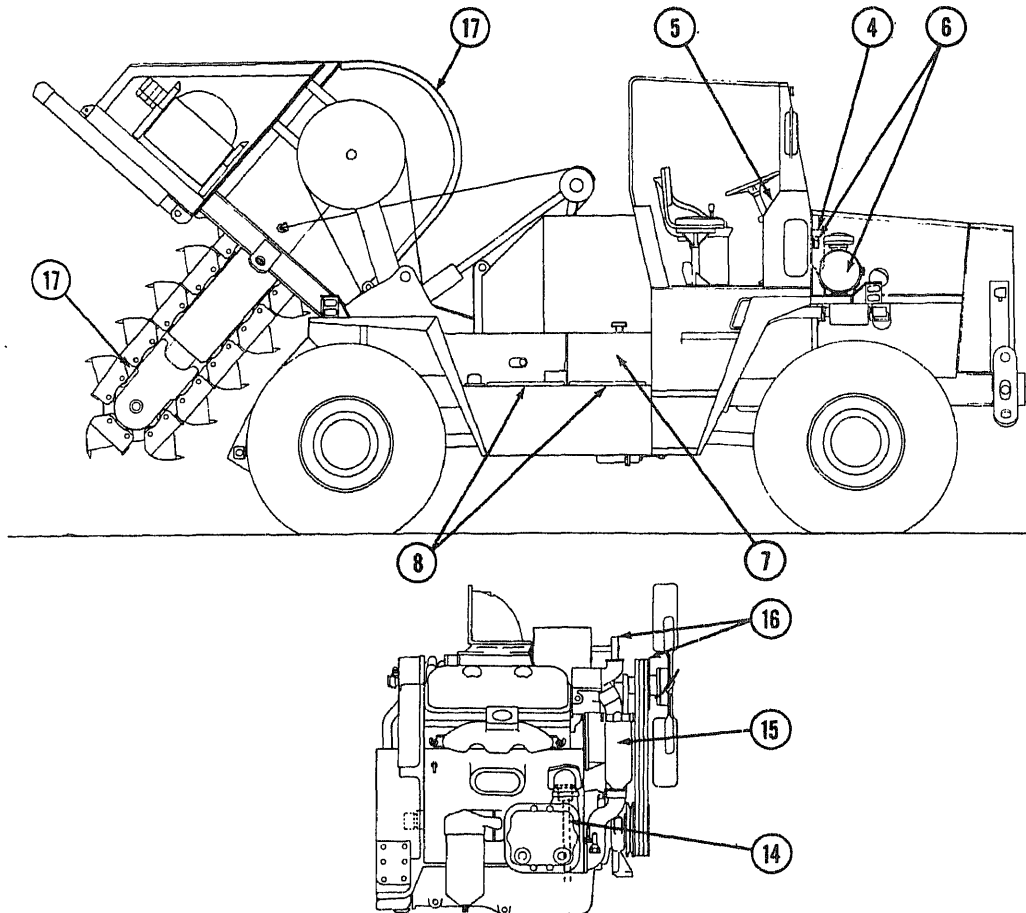


LUBRICATE IN ACCORDANCE WITH CURRENT LUBRICATION ORDER

| ITEM | | PARA. REF. |
|------|---|---------------|
| 1 | <u>ENGINE EMERGENCY SHUT OFF LEVER</u> , Inspect latch mechanism and release cable for proper operation. Be sure to latch the lever in the open-valve position. | |
| 2 | <u>RADIATOR</u> , Check for proper coolant level. Check radiator and connections for leaks. Clean air passages. Check radiator cap for proper pressure. | |
| 3 | <u>COOLING SYSTEM HOSES</u> , Tighten or replace radiator and thermostat housing hoses and fittings as required. | |
| 4 | <u>HYDRAULIC OIL COOLER</u> , Clean core and check for leaks and loose or damaged hoses and fittings. | |
| 5 | <u>CRANKCASE DIPSTICK</u> , Lubricate in accordance with the lubrication order. Drain, flush, and refill to operating level. | |
| 6 | <u>FUEL FILTER AND STRAINER</u> , Remove and clean body shells and replace filter elements. | |
| 7 | <u>V-BELTS AND PULLEYS</u> , Check belt tension. Correct adjustment is 3/4 inch deflection midway between pulleys. Replace badly worn, frayed, or deteriorated belts. Check for loose or damaged pulleys. | |
| 8 | <u>ALCOHOL EVAPORATOR</u> , Clean and refill the container. Check tubing and fittings for leaks or damage. | |
| 9 | <u>QUICK START</u> , Check tube and fittings for leaks. Replace cylinder if required. | |
| 10 | <u>AIR RESERVOIRS</u> , Drain moisture and sediment. Inspect tanks, lines, and fittings for leaks or damage, | |

ME 3805-240-12 /3-3①

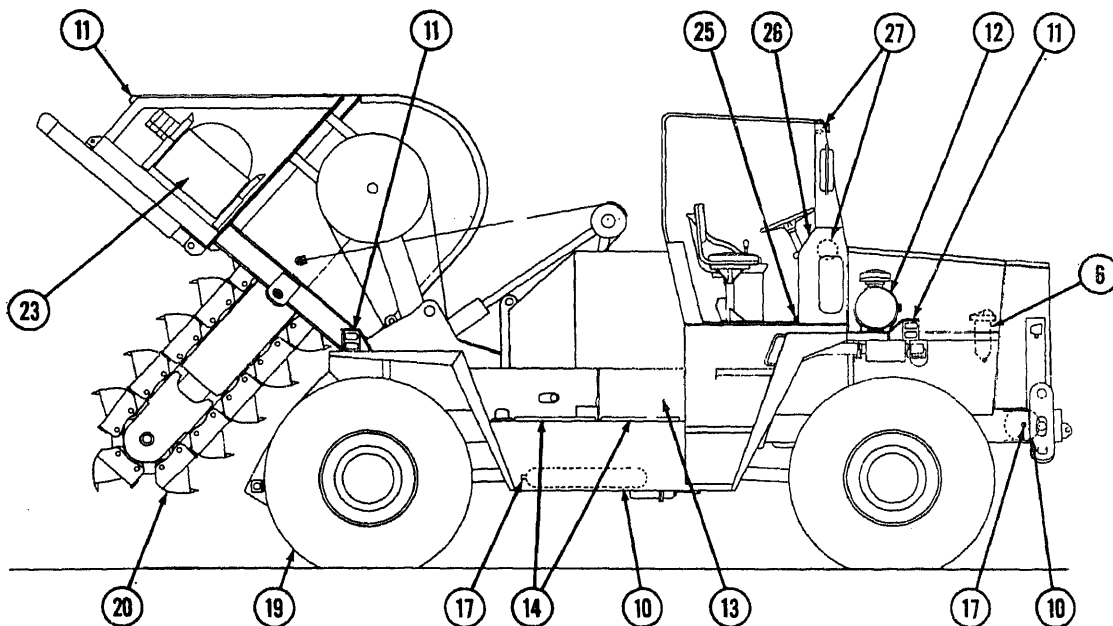
Figure 3-2(1). Preventive maintenance, daily.



LUBRICATE IN ACCORDANCE WITH CURRENT LUBRICATION ORDER

PARA.
REF.

| ITEM | | PARA. REF. |
|------|---|---------------|
| 13 | <p>INSTRUMENTS. Check for proper operation. Normal readings are as follows:</p> <p>Water Temperature.....160° F to 180° F</p> <p>Engine Oil Pressure 40 psi</p> <p>Battery-Generator Yellow Area</p> <p>Air Pressure.....90 psi</p> <p>Transmission Clutch Oil Pressure ... 100 psi to 175 psi</p> <p>Converter Oil Temperature 130° F to 250° F</p> | |
| 14 | CRANKCASE DIPSTICK. Check engine oil level. Add oil as indicated on dipstick. | |
| 15 | FUEL FILTER AND STRAINER. Open drain cocks briefly to drain off water and sediment. Check level and prime with fuel before starting, if necessary. | |
| 16 | V-BELTS. Check belt tension. Correct adjustment is 3/4 inch deflection midway between pulleys. | |
| 17 | BUCKET LINE. Immediately after digging remove all packed soil from bucket line side links and inside of boom cover assembly. | |
| | <p>NOTE 1. LUBRICATION. During lubrication of the ditching machine observe all applicable items for secure mounting and obvious defects. Correct or report all noticed defects.</p> <p>NOTE 2. OPERATION. During operation observe for any unusual noise or vibration.</p> | |



LUBRICATE IN ACCORDANCE WITH CURRENT LUBRICATION ORDER

| ITEM | | PARA. REF. |
|------|--|---------------|
| 11 | <u>LIGHTS.</u> Replace defective bulbs and lenses. Replace damaged lamps and switches. Tighten loose mountings, covers and grilles. Inspect wiring and repair broken, chafed or deteriorated wiring. | |
| 12 | <u>AIR CLEANER.</u> Remove and clean dust cup and filter element. Replace a defective element. Tighten loose mountings and fittings. Replace damaged hoses and hardware. Check restriction indicator for proper operation. | |
| 13 | <u>HYDRAULIC FLUID TANK.</u> Lubricate in accordance with the lubrication order. Inspect for leaks or damage. Check level. Clean the strainer. | |
| 14 | <u>BATTERIES.</u> Remove corrosion. Tighten loose cables and mounts. Clean filler cap vent holes. Fill to 3/8 inch above plates if necessary. In freezing weather, operate engine at least one hour after adding water. | |
| 15 | <u>TRANSMISSION.</u> Lubricate in accordance with the lubrication order. Clean breather. Tighten loose fittings. Replace damaged hoses, pipes, or fittings. | |
| 16 | <u>TRANSFER CASE.</u> Lubricate in accordance with the lubrication order. Tighten loose fittings. Inspect for leaks and damaged tubing. | |
| 17 | <u>FLUID AND AIR LINES.</u> Inspect for leaks. Replace damaged parts and tighten connections as required. | |
| 18 | <u>AXLES AND SPROCKET DRIVE.</u> Lubricate in accordance with the lubrication order. Clean breather fitting. Replace damaged breather. | |
| 19 | <u>TIRES AND WHEELS.</u> Inspect for proper air pressure (40 psi), excessive wear, cuts, imbedded foreign matter, and missing valve caps. Check for loose or missing lug nuts. | |
| 20 | <u>BUCKET LINE.</u> Inspect for badly worn teeth and proper adjustment (2 to 3 inch sag). | |
| 21 | <u>DRIVE SPROCKETS AND CHAINS.</u> Lubricate in accordance with the lubrication order. Inspect for excessive wear. | |

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Figure 3-3(1). Preventive maintenance, quarterly.

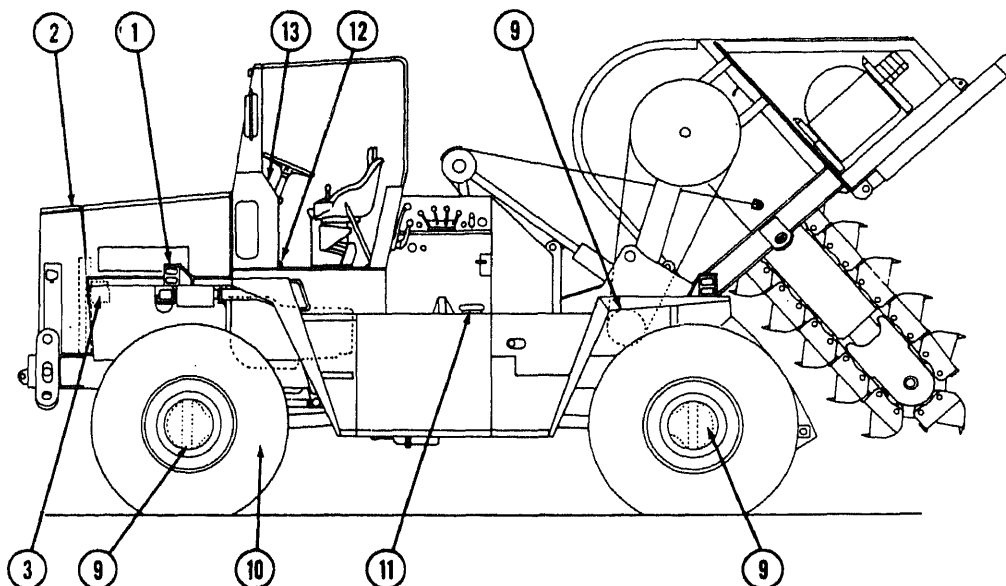
PREVENTIVE MAINTENANCE SERVICES

DAILY

TM5-3805-240-12

PARSONS MODEL 624VL

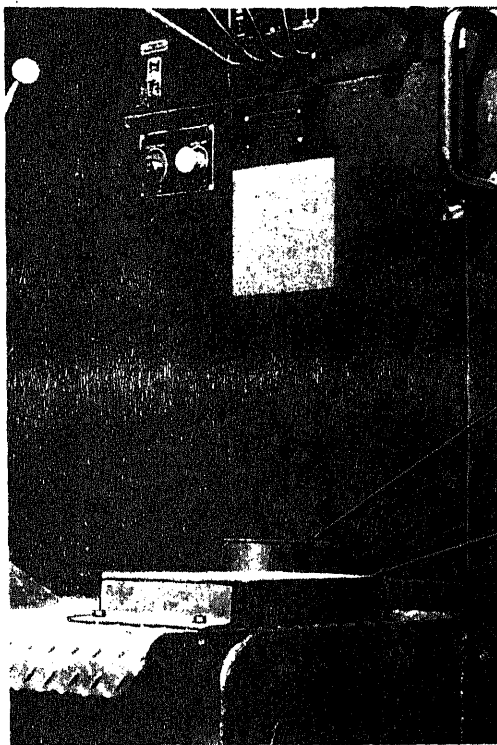
DITCHING MACHINE



LUBRICATE IN ACCORDANCE WITH CURRENT LUBRICATION ORDER

| ITEM | | PARA. REF. |
|------|--|---------------|
| 1 | <u>ENGINE EMERGENCY SHUT OFF LEVER.</u> Be sure lever is latched in the open-valve position. | |
| 2 | <u>RADIATOR.</u> Check level. Fill to 2 in. below filler neck. Remove grille, loosen oil cooler, and clean cores. (Monthly) | |
| 3 | <u>ALCOHOL EVAPORATOR.</u> Check fluid level. Fill to 1 inch below cover. | |
| 4 | <u>QUICK START.</u> Check cylinder and replace if empty. | |
| 5 | <u>AIR RESERVOIRS.</u> Drain moisture and sediment. | |
| 6 | <u>AIR CLEANER.</u> Check air restriction indicator. Empty dust-cup. | |
| 7 | <u>HYDRAULIC FLUID TANK.</u> Check level. Fill as required. | |
| 8 | <u>BATTERIES.</u> Inspect for loose terminals and electrolyte level. Fill to 3/8 inch above plates. In freezing weather run engine at least one hour after adding water. | |
| 9 | <u>AXLES AND SPROCKET DRIVE.</u> Lubricate in accordance with the lubrication order. Check oil level (Weekly). | |
| 10 | <u>TIRES.</u> Check for proper air pressure (40 psi). | |
| 11 | <u>FUEL TANK.</u> Check fuel level and fill. | |
| 12 | <u>BRAKES.</u> Check for proper operation. | |

| ITEM | LUBRICATE IN ACCORDANCE WITH CURRENT LUBRICATION ORDER | PARA. REF. |
|------|--|---------------|
| 22 | <u>HOIST CABLE AND SHEAVES.</u> Lubricate in accordance with the lubrication order. Inspect for excessive wear and damage. | |
| 23 | <u>CONVEYOR.</u> Inspect belt and flashing for excessive wear and damage. Inspect drums and rollers for misalignment and damage. | |
| 24 | <u>FUEL TANK.</u> Inspect for loose mounting hardware and connections. Inspect filler cap. Clean strainer. Drain off water and dirt. Check fuel level. Inspect for damage. | |
| 25 | <u>BRAKES.</u> Inspect for proper operation. Inspect brake chambers and lines for leaks or damage. Re-set slack adjusters as required. | |
| 26 | <u>INSTRUMENTS.</u> Replace broken glass and tighten loose mountings and connections. Normal operating ranges for instruments are as follows: Water Temperature160° to 180° F Engine Oil Pressure 40 psi Battery-GeneratorYellow area Air Pressure..... 90 psi Transmission, Clutch Oil Pressure 100 psi to 175 psi Converter Oil Temperature.....130° F to 250° F | |
| 27 | <u>SENDING UNITS AND WARNING SWITCHES.</u> Check low air pressure indicator and buzzer for proper operation. Check turn signal, flasher, and horn. Inspect fuel gage float for proper operation. | |
| | <u>NOTE 1. LUBRICATION.</u> During lubrication of the ditching machine observe all applicable items for secure mounting and obvious defects. Correct or report all noticed defects. | |
| | <u>NOTE 2. OPERATION.</u> During operation check all levers for correct operation and freedom of movement. Observe for any unusual noise or vibration. | |
| | <u>NOTE 3. ADJUSTMENTS.</u> Make all adjustments found necessary during operation. | |



FUEL TANK

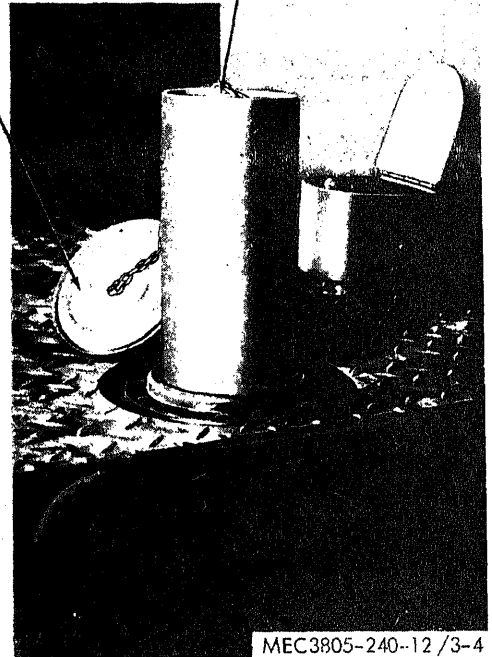
3. REMOVE FILLER CAP.

1. OPEN FUEL GAGE
COVER. CHECK FUEL
LEVEL.

2. OPEN FILLER
CAP COVER.

5. FILL TANK
KEEP FILLED IN
COLD WEATHER
TO MINIMIZE
MOISTURE CON-
DENSATION IN
TANK.

4. CLEAN STRAINER.



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Figure 3-4. Fuel tank service.

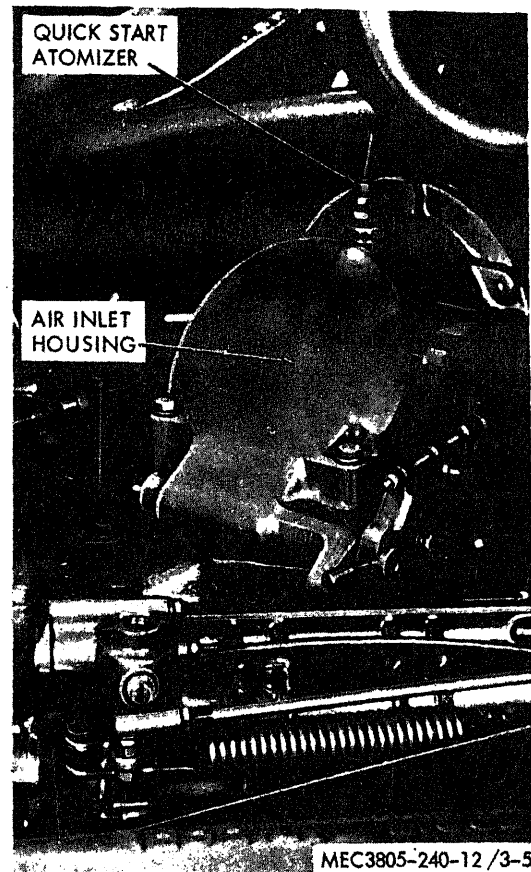
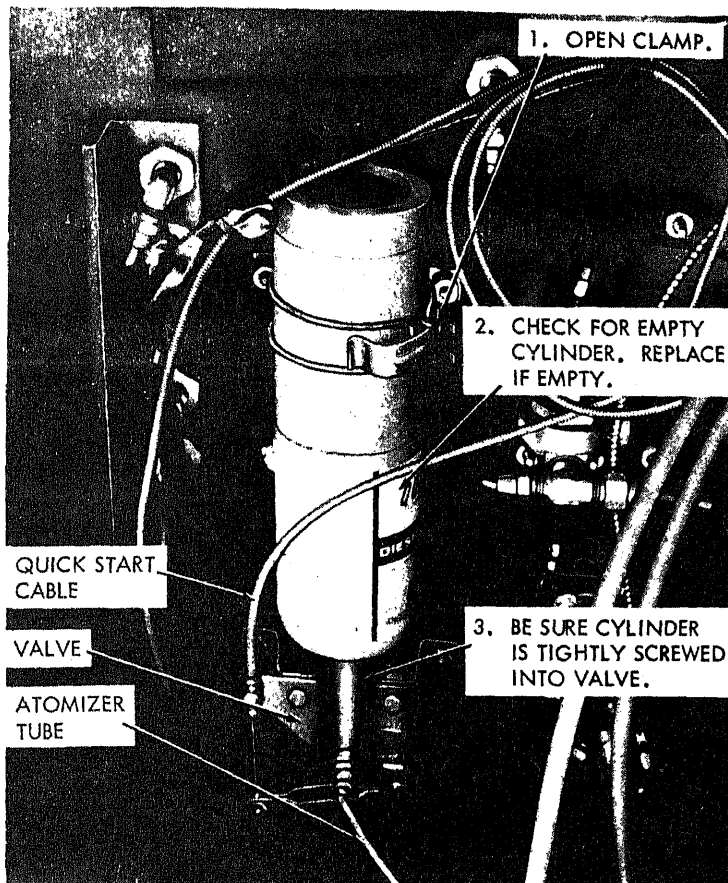


Figure 3-5. Quick start assembly service.

1. REMOVE AND INSPECT RADIATOR
CAP VALVE FOR PROPER OPERATION.

2. CHECK HOSE (2) AND
CLAMP (2) FOR LEAKS
OR DAMAGE.

3. CHECK BELT TENSION. (3/4 INCH DEFLECTION
MIDWAY BETWEEN PULLEYS.)

4. FILL RADIATOR TO 2 INCHES BELOW
FILLER NECK.

MEC3805-240-12 /3-6

Figure 3-6. Cooling system service.

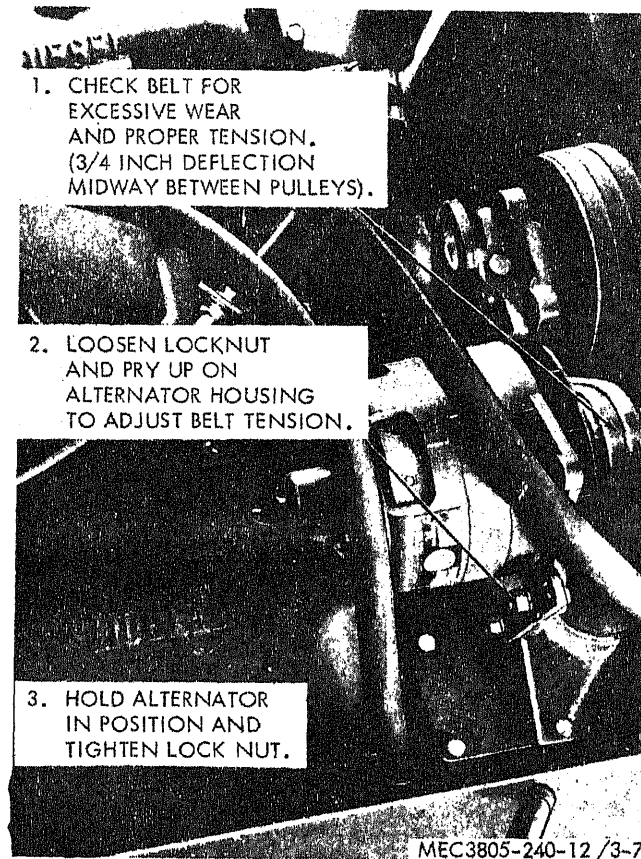
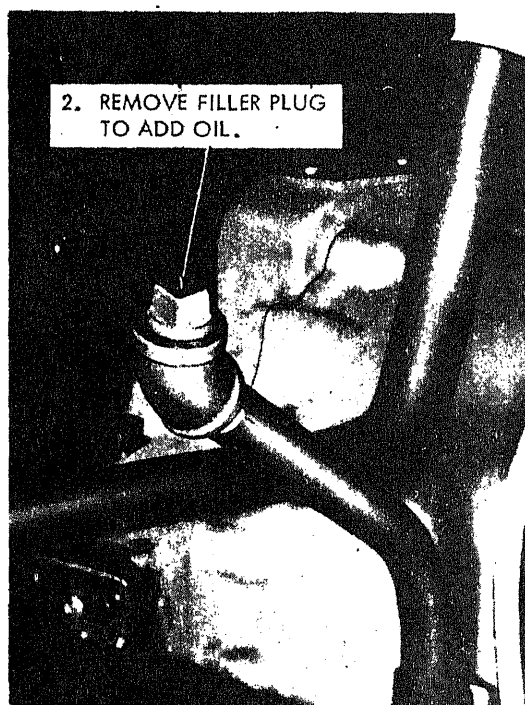


Figure 3-7. Alternator drive belt adjustment.



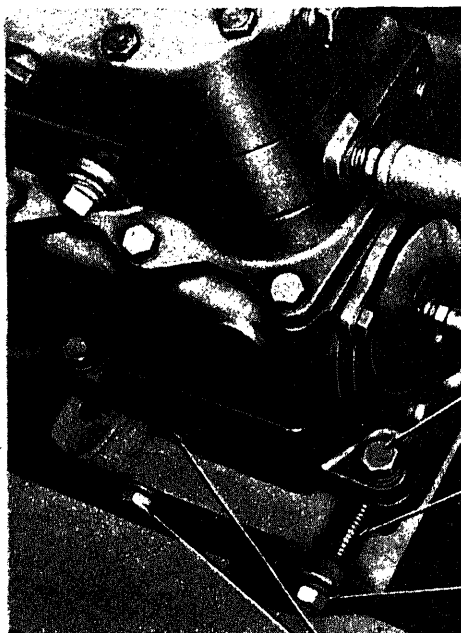
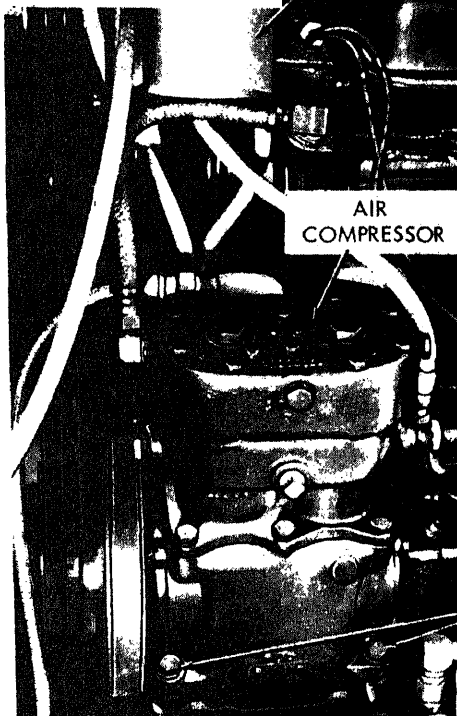
MEC3805-240-12 /3-8

Figure 3-8. Transmission service.

1. CHECK BELT FOR EXCESSIVE WEAR AND PROPER TENSION (3/4 INCH DEFLECTION BETWEEN PULLEYS).

ALCOHOL
EVAPORATOR

AIR
COMPRESSOR



2. LOOSEN MOUNTING BOLTS (4)

4. LOOSEN LOCKNUT AND TURN ADJUSTING SCREW AS REQUIRED. TIGHTEN LOCKNUT.

5. TIGHTEN MOUNTING BOLTS (4).

6. TURN POSITIONING SCREW IN FIRMLY AGAINST BASE.

3. BACK OFF POSITIONING SCREW.

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Figure 3-9. Air compressor belt service.

Section V. TROUBLESHOOTING

3-15. General

This section provides information useful in diagnosing and correcting unsatisfactory operation or failure of the ditching machine and its components. Each trouble symptom states is followed by a list of probable causes. The possible remedy recommended is described opposite the probable cause. Any trouble beyond the scope of organizational maintenance shall be reported to direct support maintenance.

3-16. Engine Will Not Crank

| Probable cause | Possible remedy |
|----------------------|---|
| Starter inoperative | Inspect for faulty battery cables and terminals and correct as necessary (para 3-52). |
| Engine oil too heavy | Use the correct grade of oil (LO 5-3805-240-12). |
| Defective starter | Replace the starter motor (para 3-45). |
| Defective batteries | Replace the batteries (para 3-52). |

3-17. Engine Stops Suddenly

| Probable cause | Possible remedy |
|-----------------------------------|--|
| Fuel filter and strainer clogged. | Service the fuel filter (para 3-34). |
| Moisture in fuel tank | Drain entire fuel system including water trap and filter. Fill with fuel and vent air from system. |

3-18. Engine Will Not Operate

| Probable cause | Possible remedy |
|----------------------------------|---|
| Fuel tank empty | Fill fuel tank. |
| Fuel filter or strainer clogged. | Disassemble, clean, and replace fuel filters (para 3-34). |
| Defective fuel pump | Report this condition to direct support maintenance. |
| Emergency shut off valve closed. | Open valve. |

3-19. Engine Misfires or Does Not Idle Properly

| Probable cause | Possible remedy |
|---------------------------|--|
| Air in fuel lines | Tighten fittings. |
| Water in fuel | Service the filters. |
| Incorrect valve clearance | Report this condition to direct support maintenance. |
| Defective fuel injectors | Report this condition to direct support maintenance. |
| Defective fuel pump | Report this condition to direct support maintenance. |

3-20. Engine Lacks Power

| Probable cause | Possible remedy |
|--|--|
| Fuel injectors defective | Report this condition to direct support maintenance. |
| Valves out of adjustment | Report this condition to direct support maintenance. |
| Engine worn out or damaged internally. | Report this condition to direct support maintenance. |

3-21. Engine Smokes Excessively

| Probable cause | Possible remedy |
|--------------------------|--|
| Defective fuel injectors | Report this condition to direct support maintenance. |
| Defective fuel pump | Report this condition to direct support maintenance. |

3-22. Oil Pressure Low

| Probable cause | Possible remedy |
|--|---|
| Oil level low | Inspect the level of the oil in the crankcase. Add oil if necessary (LO 5-3805-240-12). |
| Improper weight of oil or diluted oil. | Change the oil in the crankcase (LO 5-3805-240-12). |
| Defective oil pump | Report this condition to direct support maintenance. |

3-23. Engine Overheats

| Probable cause | Possible remedy |
|---------------------------------------|--|
| Insufficient water in cooling system. | Check coolant level in radiator (para 3-11). |
| Cooling system clogged | Flush out radiator and engine. Fill cooling system. |
| Engine overloaded | Reduce load. |
| Radiator fins dirty | Clean fins. |
| Damaged radiator | Report this condition to direct support maintenance. |

Probable cause

Possible remedy

| | |
|--|---|
| Defective water pump | Replace water pump (para 3-39). |
| Defective thermostat | Replace thermostat (para 3-40). |
| Loss of coolant due to deteriorated hose | Replace radiator hose (para 3-37). |
| Defective fan belts | Replace fan belts (para 3-38). |
| Insufficient engine oil | Check crankcase oil level. Add oil as necessary (LO 5-3805-240-12). |

3-24. Battery Discharges

| Probable cause | Possible remedy |
|-----------------------------|--|
| Connections loose | Tighten the battery connections. |
| Connections are dirty | Clean all battery connections (para 3-52). |
| Defective voltage regulator | Adjust or replace regulator (para 3-43). |
| Defective alternator | Replace alternator (para 3-43). |
| Short in electrical system | Inspect wiring for damaged condition or accidental contact with vehicle chassis. |

3-25. Hard or Difficult Steering

| Probable cause | Possible remedy |
|---|---|
| Low or uneven tire pressure | Inflate tires to proper pressure. |
| Hydraulic oil level low | Fill hydraulic oil tank to proper level (LO 5-3805-240-12). |
| Defective steering assist hydraulic pump. | Report this condition to direct support maintenance. |
| Steering linkage out of adjustment. | Adjust linkage. |
| Defective hydraulic steering unit. | Report this condition to direct support maintenance. |

3-26. Boom Settles Gradually From Raised Position (In Digging Position)

| Probable cause | Possible remedy |
|---|--|
| Defective boom hoist pilot check valve. | Report this condition to direct support maintenance. |
| Leaking cylinder rings | Report this condition to direct support maintenance. |

3-27. Low or No Air Pressure

| Probable cause | Possible remedy |
|------------------------------------|--|
| Loose or damaged airlines | Tighten fittings or replace. |
| Damaged valves or reservoirs. | Report this condition to direct support maintenance. |
| Defective air compressor governor. | Replace governor. |
| Defective air compressor | Report this condition to direct support maintenance. |

3-28. Spoil Conveyor Belt Runs Slowly or Will Not Run

| Probable cause | Possible remedy |
|--|--|
| Broken hydraulic line in conveyor belt motors circuit. | Replace broken line. |
| Conveyor belt loose ----- | Adjust conveyor belt. |
| One or both conveyor hydraulic motors defective. | Report this condition to direct support maintenance. |
| Conveyor hydraulic pump defective. | Report this condition to direct support maintenance. |

3-29. Spoil Conveyor Will Not Shift Position

| Probable cause | Possible remedy |
|---|--|
| Broken hydraulic line in shift motor circuit. | Replace broken line. |
| Defective conveyor shift hydraulic motor. | Report this condition to direct support maintenance. |

3-20. Bucket Line Will Not Operate While Digging

| Probable cause | Possible remedy |
|-----------------------------------|---|
| Overload release clutch slipping. | Check for low air pressure. Pressure regulator should be set for 20-23 psi. |

Section VI. DIESEL ENGINE FUEL SYSTEM

3-32. General

a. The fuel system illustrated in figure 3-10 includes the following: injectors, fuel pipes, manifolds (built into the cylinder head), fuel pump, strainer, filter and fuel tank.

b. Fuel is drawn from the tank through the strainer and enters the fuel pump at the inlet side. Leaving the pump under pressure, fuel is forced through the filter and into the upper fuel manifold, then through fuel pipes into the inlet side of the injectors. Excess fuel cools the injectors and flows back to the tank through the fuel return lines.

3-33. Fuel Pump

a. Inspection.

(1) Check for leaks around flanges and tube fittings. Tighten loose mounting bolts and fittings.

(2) Check for a broken drive shaft or drive coupling. Insert the end of a wire through one of the pump flange drain holes, then crank the engine momentarily to see if the wire vibrates. Vibrations will be felt if the pump shaft rotates.

| Probable cause | Possible remedy |
|-------------------------------|--|
| Defective control valve ----- | Report this condition to direct support maintenance. |

3-31. Crowd Drive Will Not Operate

| Probable cause | Possible remedy |
|--|--|
| Transfer case shift lever not in crowd position. | Shift the shift lever to crowd position. |
| Broken lines in hydraulic pump circuit. | Replace defective lines. |
| Defective hydraulic crowd controls. | Report this condition to direct support maintenance. |
| Defective hydraulic pump ----- | Report this condition to direct support maintenance. |
| Defective crowd motor ----- | Report this condition to direct support maintenance. |
| Defective transfer case ----- | Report this condition to direct support maintenance. |

b. Checking Fuel Flow.

(1) Disconnect the fuel return line from the fitting near the radiator hose and hold the open end in a convenient receptacle (fig. 3-11).

(2) Start and run the engine at 1,200 rpms and measure the fuel flow for a period of one minute. A flow of approximately 0.8 gallon of fuel per minute is normal.

(3) Immerse the end of the fuel line in the container. Air bubbles rising to the surface of the fuel will indicate air being drawn into the fuel system on the suction side of the pump. If air is present, tighten all fuel line connections between the fuel tank and the fuel pump.

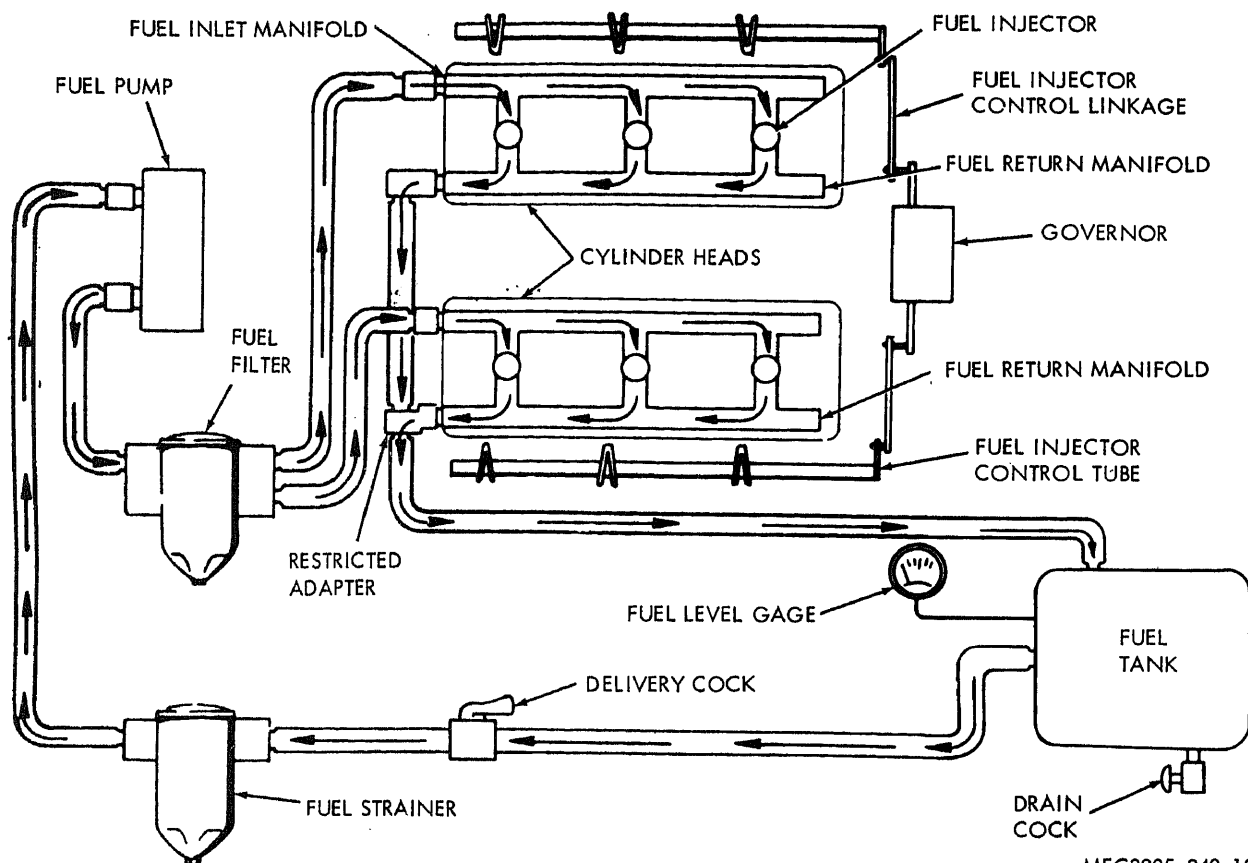
(4) If the fuel flow is insufficient for satisfactory engine performance, then:

(a) Replace the element in the fuel strainer. Start the engine and run it at 1,200 rpm to check the fuel flow. If the flow is still unsatisfactory, perform step (b) below.

(b) Replace the element in the fuel filter. If the flow is still unsatisfactory, report to direct support maintenance.

(c) Check the fuel lines for restrictions due to bends or other damage.

(5) If the engine still does not perform satisfactorily, one or more fuel injectors may be



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Figure 3-10. Engine Fuel System Diagram.

at fault. Report this condition to direct support maintenance.

3-34. Fuel Strainer and Filter

a. General.

(1) The fuel strainer and fuel filter are similar in construction and consist mainly of a shell, cover, and filtering element.

(2) A cast letter "P" (primary) appears on the top of the strainer cover and the letter "S" (secondary) is on the top of the filter cover.

b. Service.

(1) Open the drain cocks daily to remove dirt and water from the sump.

(2) Install new elements in the strainer and filter every 8,000 to 12,000 miles; or every 250 hours of operation, whichever comes first; or when clogging is indicated.

(3) Refer to figure 3-12 and replace the elements.

c. Replacement. Refer to figure 3-13 and replace the fuel filter or strainer.

3-35. Fuel Lines and Tank

a. Fuel Lines.

(1) Flexible fuel lines are used to facilitate connection of the lines leading to and from the fuel tank, and to minimize the effects of any vibration in the installation.

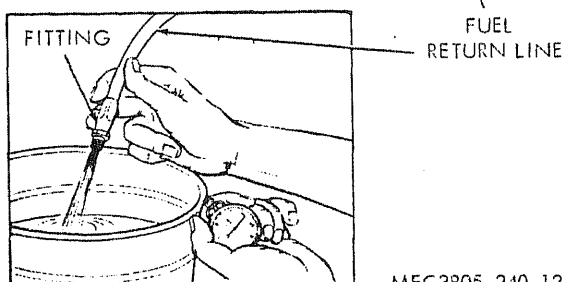
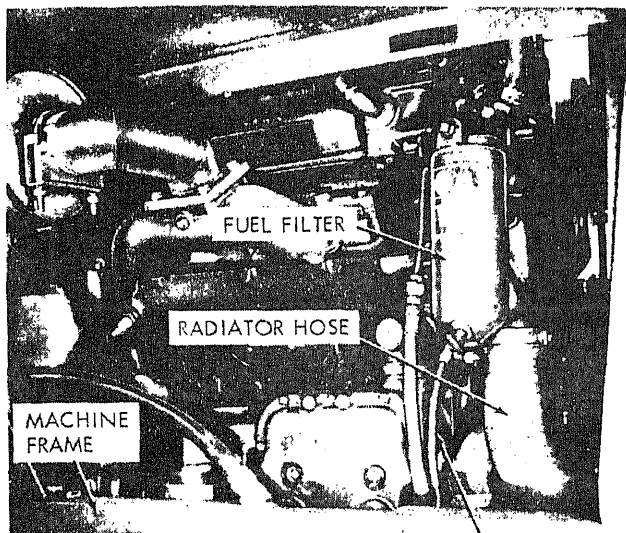
(2) When installing fuel lines, it is recommended that the connections be tightened only sufficiently to prevent leakage of fuel; thus, the flared ends of the fuel lines will not become twisted or fractured because of excessive tightening.

(3) After fuel lines are installed, run the engine long enough to determine whether or not all connections are sufficiently tight. If any leaks occur, tighten the connections only enough to stop the leak.

(4) Check the filter and strainer cover bolts for tightness.

b. Tank.

(1) Keep the fuel tank filled to reduce condensation to a minimum.



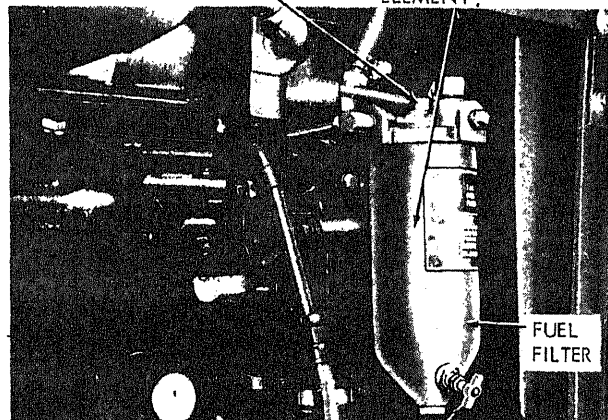
MEC3805-240-12- /3-11

Figure 3-11. Checking fuel flow from fuel return line.

(2) Open the drain at the bottom of the fuel tank every 500 hours or 15,000 miles to drain off any water or sediment.

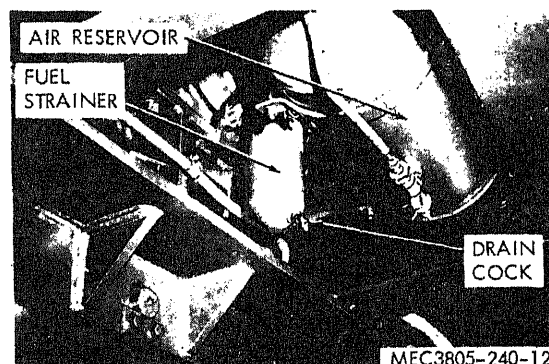
(3) Refer to figure 3-14 to replace a damaged fuel tank.

2. LOOSEN COVER SCREW ENOUGH TO ALLOW FUEL TO DRAIN FREELY.
3. SUPPORT SHELL AND UNSCREW COVER BOLT, REMOVE SHELL AND DISCARD FILTER ELEMENT.



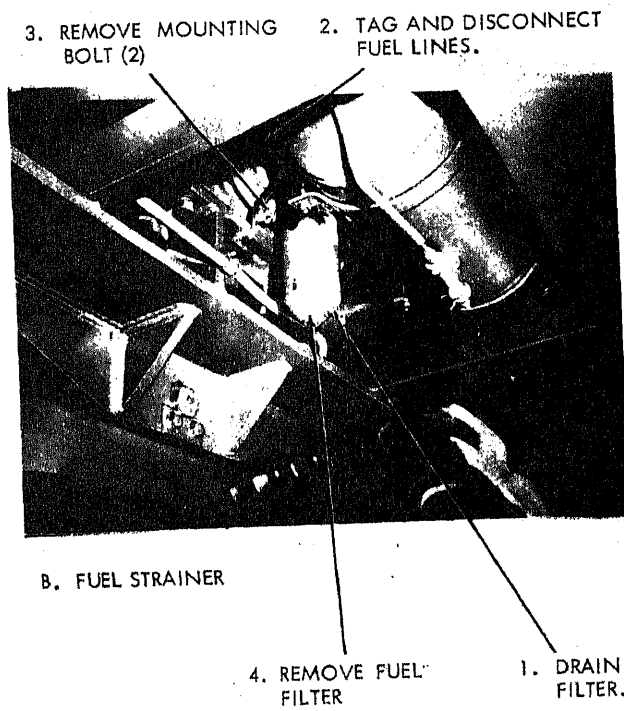
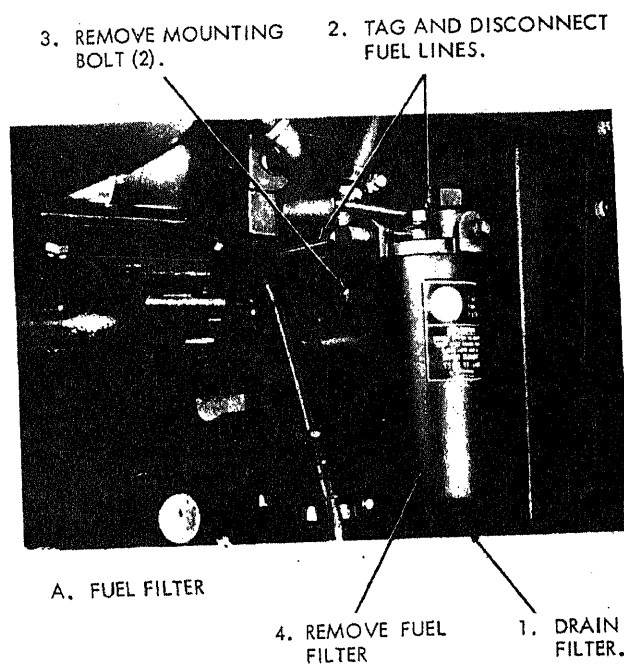
1. OPEN DRAIN COCK AND DRAIN FUEL INTO A CONTAINER.

4. WASH THE SHELL THOROUGHLY WITH FUEL OIL AND DRY IT WITH COMPRESSED AIR.
5. EXAMINE THE FILTER ELEMENT SEAT AND THE RETAINING RING TO MAKE SURE THEY HAVE NOT SLIPPED OUT OF PLACE. CHECK THE SPRING BY PRESSING ON THE ELEMENT SEAT. WHEN RELEASED, THE SEAT MUST RETURN AGAINST THE RETAINING RING.
6. CLOSE DRAIN COCK, INSERT NEW ELEMENT AND FILL SHELL TWO-THIRDS FULL WITH CLEAN FUEL OIL.
7. INSTALL SHELL AND TIGHTEN COVER SCREW.
8. REMOVE FILLER PLUG AND COMPLETE FILLING OF SHELL.



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Figure 3-12. Fuel filter and strainer service.



MEC3805-240-12 /3-13

Figure 3-13. Fuel filter and strainer replacement.

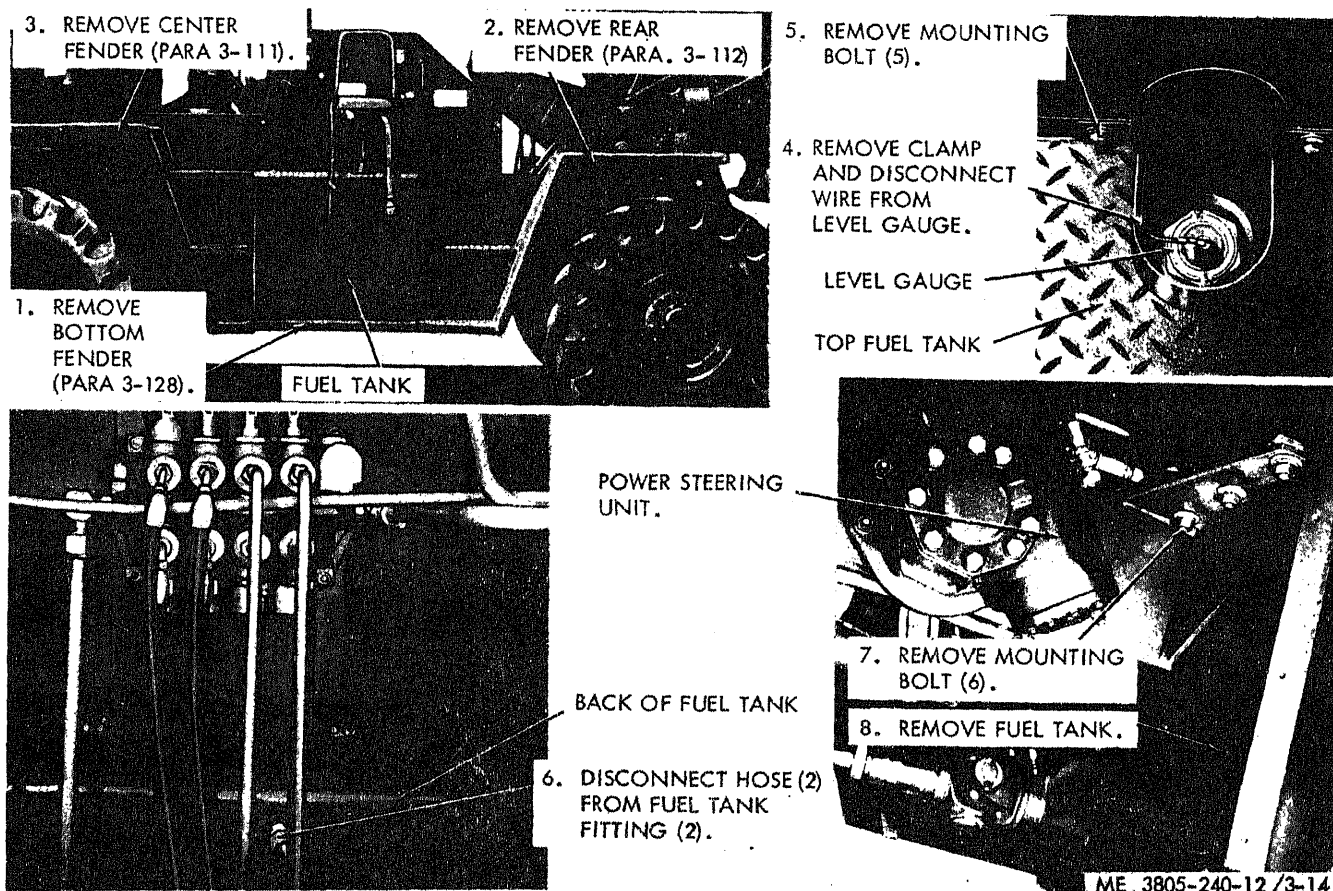


Figure 3-14. Fuel tank replacement.

Section VII. COOLING SYSTEM

3-36. General

a. The cooling system basically consists of a radiator and fan, water pump, and two thermostats.

b. Coolant is drawn from the lower portion of the radiator by the water pump and is forced through the oil cooler housing and into the cylinder block (fig. 3-15). From the cylinder block the coolant passes up through the cylinder heads and, when the engine is at normal operating temperature, through the thermostat housings and into the upper portion of the radiator. Then the coolant passes down a series of tubes, where the coolant temperature is lowered by the air stream created by the revolving fan.

c. When the coolant is below operating temperature, it is restricted at the thermostat housing, and a by-pass provides water circulation within the engine during the warm-up period.

3-37. Radiator

a. Inspection.

(1) Examine the radiator for cracks or other

damage. The core fins should be straight and evenly spaced to permit a full flow of cooling air. The core tubes should be clean inside and outside and have no leaks.

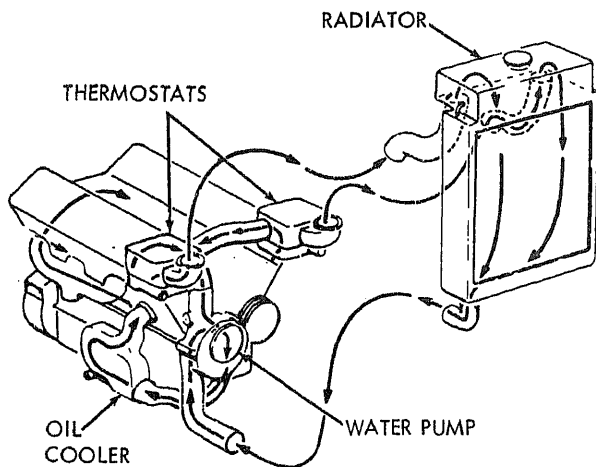
(2) Inspect the exterior of the radiator core every 1,000 hours or 30,000 miles and, if necessary, clean it with a quality grease solvent such as Oleum (never use fuel oil, kerosene, or gasoline) and compressed air. It may be necessary to clean the radiator more frequently if the engine is being operated in dusty or dirty areas.

(3) Check all radiator hoses and clamps. Replace cracked and deteriorated hoses and damaged clamps.

b. Cleaning.

(1) Once a month remove the grille (para 3-106) and loosen oil cooler mounting bolts.

(2) An air hose with a suitable nozzle may be sufficient to remove loose dust from the radiator core. Sometimes oil may be present requiring the use of a solvent, such as oleum, to loosen the dirt. The use of gasoline, kerosene, or fuel oil is NOT recommended as a solvent.



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Figure 3-15. Cooling system diagram.

(3) A spray gun is an effective means of applying the solvent to the radiator core. Use air to remove the remaining dirt. Repeat this process as many times as necessary, then rinse the radiator with clean water and dry it with air.

Warning: Provide adequate ventilation of the working area to avoid possible toxic effects of the cleaning spray.

3-38. Fan Assembly

a. Inspection.

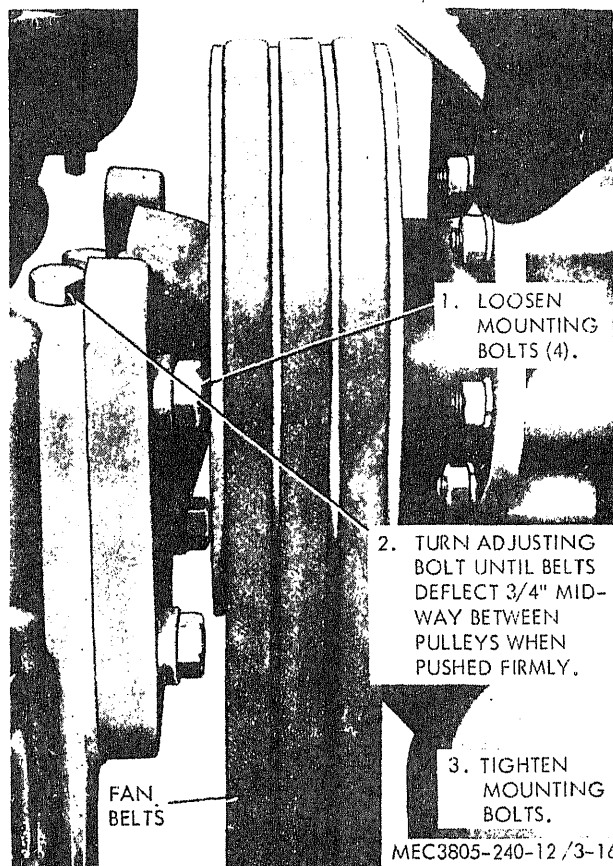
(1) Clean the fan and related metal parts with clean fuel oil, and dry them with compressed air.

(2) Check for bent or cracked fan blades.

(3) Look for cracks in the adjusting and support bracket castings (fig. 3-16).

b. *Belt Adjustment.* Refer to figure 3-16 and adjust the fan belts.

c. *Belt Replacement.* Refer to figure 3-17 and replace the fan belts.



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Figure 3-16. Fan belt adjustment.

3-39. Water Pump Assembly

a. Inspection.

(1) Inspect the water pump for leaks, cracks, or other damage. Replace if necessary.

(2) Tighten loose hose clamps and replace defective hoses.

b. Replacement.

(1) Refer to figure 3-18 and replace the water pump.

(2) Be sure to re-install the packing ring on the back of the water pump body before mounting to engine.

3-40. Thermostats and Housings

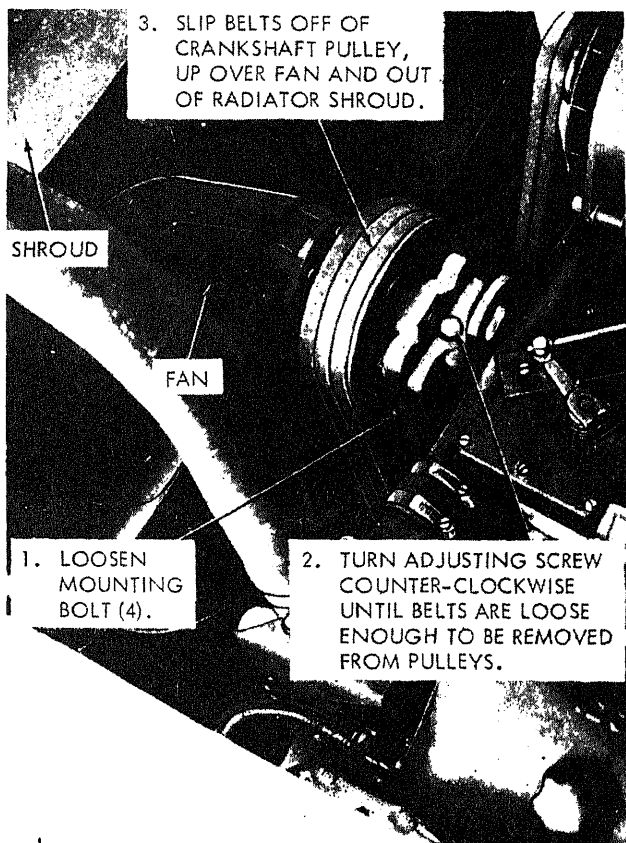
a. Removal.

(1) Drain the cooling system to the necessary level by opening the drain cocks on the cylinder block.

(2) Remove the thermostats and housings in the numerical sequence as illustrated on figure 3-19.

b. Cleaning.

(1) Clean the thermostat seating surfaces in the housing and covers.



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Figure 3-17. Fan belt replacement.

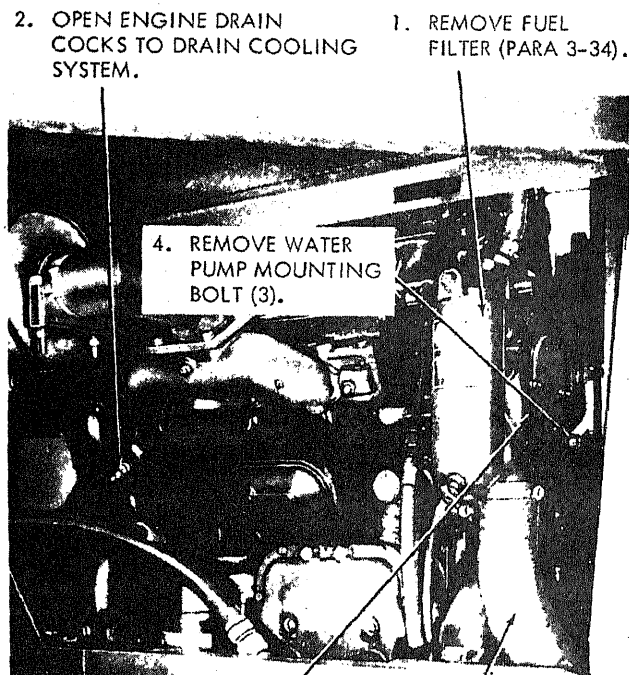
(2) Remove the seals from the thermostat covers. Clean the seal groove in the covers. Discard the old gaskets.

c. Inspection.

(1) The operation of a thermostat may be checked by immersing it in a container of hot water, see figure 3-20. Place a thermometer in the container, but do not allow it to touch the bottom of the container.

(2) Agitate the water to maintain an even temperature throughout the container.

(3) As the water is heated, the thermostat should begin to open when the water temperature is approximately 165° or 170°F (the opening temperature is usually stamped on the thermostat). The thermostat should be fully open at



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Figure 3-18. Water pump replacement.

approximately 180° or 185°F depending upon which thermostat is used.

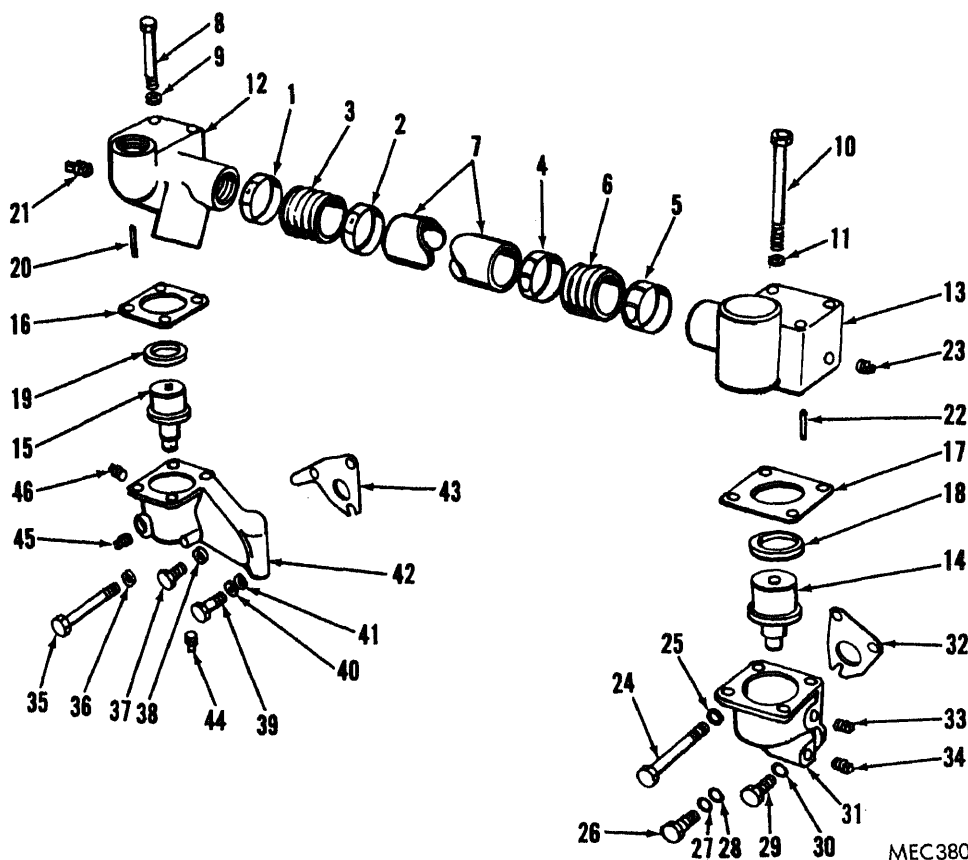
d. Installation.

(1) Install the thermostats and housings in reverse of the numerical sequence as illustrated on figure 3-19.

(2) If defective, replace the seals (18 and 19). Position the seal so that the lip of the seal faces up (away from the thermostat) when the cover is installed on the thermostat housing. Assure that the seal is positioned the correct distance from the bottom face of the cover and parallel with the cover face.

(3) Tighten the thermostat cover bolts to 30-35 ft-lb torque.

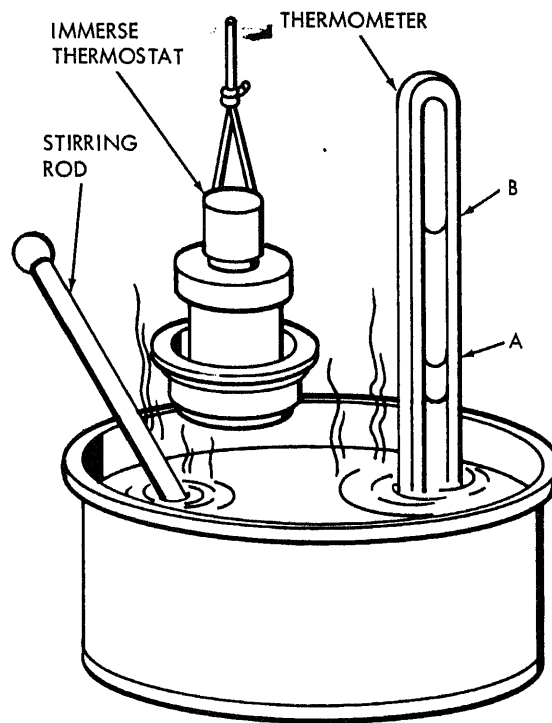
(4) Reconnect all hoses, fill radiator, start the engine, and check for leaks.



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- | | | | |
|----|-----------------------------|----|--------------------------|
| 1 | Clamp | 24 | Bolt, 3/8-16 x 4 in. |
| 2 | Clamp | 25 | Flatwasher |
| 3 | Hose | 26 | Bolt, 3/8-16 x 1 1/2 in. |
| 4 | Clamp | 27 | Copper washer |
| 5 | Clamp | 28 | Copper washer |
| 6 | Hose | 29 | Bolt, 3/8-16 x 1 in. |
| 7 | Tube | 30 | Washer |
| 8 | Bolt, 3/8 x 3 1/2 in. (4) | 31 | Housing (left bank) |
| 9 | Lockwasher (4) | 32 | Gasket (left bank) |
| 10 | Bolt, 3/8 x 3 1/2 in. (4) | 33 | Plug, pipe |
| 11 | Lockwasher (4) | 34 | Plug, pipe |
| 12 | Cover assembly (right bank) | 35 | Bolt, 3/8-16 x 3 3/4 in. |
| 13 | Cover assembly (left bank) | 36 | Flat washer |
| 14 | Thermostat | 37 | Bolt, 3/8-16 x 1 in. |
| 15 | Thermostat | 38 | Washer |
| 16 | Gasket | 39 | Bolt, 3/8-16 x 1 1/2 in. |
| 17 | Gasket | 40 | Copper washer |
| 18 | Seal | 41 | Copper washers |
| 19 | Seal | 42 | Housing (right bank) |
| 20 | Jiggle pin | 43 | Gasket (right bank) |
| 21 | Plug, pipe | 44 | Plug, pipe |
| 22 | Jiggle pin | 45 | Plug, pipe |
| 23 | Plug, pipe | 46 | Plug, pipe |

Figure 3-19. Thermostat and housing replacement.



A - STARTS TO OPEN AT 165° TO 170° F
B - FULLY OPEN AT 180° TO 185° F

MEC3805-240-12 /3-20

Figure 3-20. Checking thermostat operation.

Section VIII. ELECTRICAL SYSTEM

3-41. General

The 24-volt electrical system includes four 12-volt batteries, alternator, voltage regulator, reverse polarity relay, starter, and connecting wiring. The alternator charges the batteries and supplies energy for lights and accessories. The voltage regulator controls the alternator output. The starter turns the flywheel to start the engine. Wiring of rubber-insulated type used throughout the system is tagged as indicated on the wiring diagram (fig. 1-3).

3-42. Alternator

a. General. The alternator is a 24-volt self-rectifying unit having two DC output terminals (negative and positive) and two field terminals. A fan is attached to the alternator pulley for cooling. The unit is self load-limiting, anti-fungus and anti-corrosion treated. Refer to figure 3-21 for the alternator performance curve.

Caution: Disconnect the batteries before working on electrical system.

b. On vehicle testing.

(1) *Stator grounds.*

- (a) Connect a 110 or 220 volt test lamp to the alternator frame as shown on figure 3-22.
- (b) Touch each of the three stator phase screws with the other test lamp wire. The lamp should not light.

(2) *Stator winding continuity.*

- (a) Connect an ohmmeter or test lamp to each of the three phase screws as shown on figure 3-22.

(b) Each phase should show a low resistance or the lamp should glow.

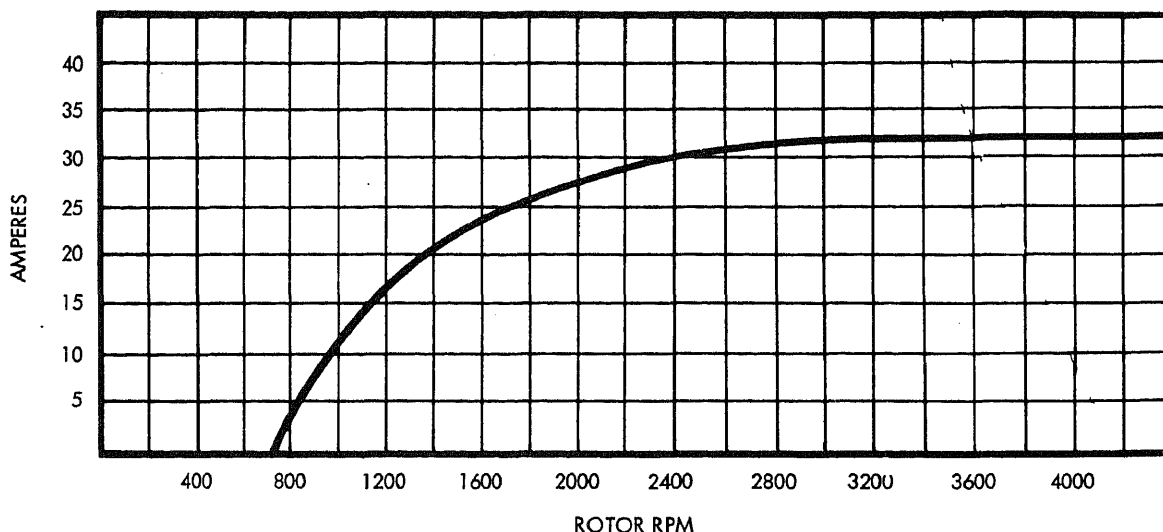
(3) *Rotor coil resistance.*

- (a) Remove the two brush holders and slip ring brushes.

(b) Insert an ohmmeter prod into each brush holder opening to touch both slip rings.

(c) The ohmmeter should show a resistance of about $16.9 \pm .8$ ohms.

(d) Very low resistance can result from a shorted coil. No resistance indicates an open rotor coil circuit. Collapsed brush springs are a sign of shorted turns within the rotor coil.



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Figure 3-21. Alternator performance curve.

(4) Rectifier cells.

(a) First identify the positive and negative prods on an ohmmeter. An ordinary flashlight battery may be used. With one prod touching the carbon center rod and the other touching the case, a high reading results when the prod at the carbon rod is positive (+). No reading at all means the prod at the carbon rod is negative (-).

(b) Place the positive prod of the ohmmeter on the G- alternator terminal and touch each AC terminal with the negative prod. The ohmmeter should indicate a very high resistance to figure 3-23.

(c) Place the negative prod of the ohmmeter on the G- alternator terminal and touch each AC terminal with the positive prod. The ohmmeter should indicate a very high resistance or infinity.

(d) Place the negative prod of the ohmmeter on the G+ alternator terminal and touch each AC terminal with the positive prod. The ohmmeter should indicate a low resistance.

(e) Place the positive prod of the ohmmeter on the G+ alternator terminal and touch

each AC terminal with the negative prod. The ohmmeter should indicate a very high resistance or infinity.

(5) Replace a defective alternator as determined by the above tests.

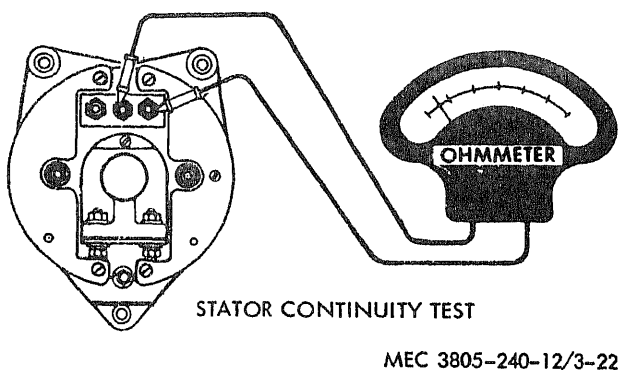
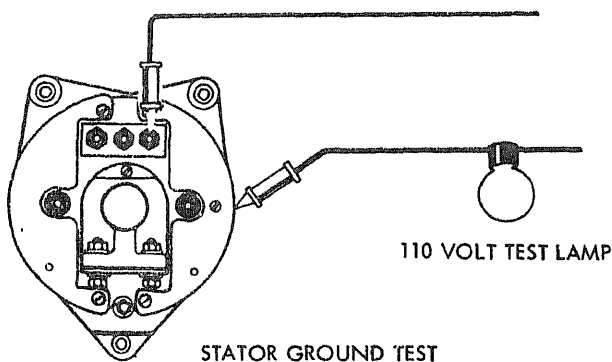
c. *Removal and Installation.* Refer to figure 3-24 to remove and install the alternator.

Caution: Use care when connecting wiring to alternator and batteries to avoid damaging the alternator rectifier cells.

3-43. Voltage Regulator

a. *General.* The regulator is a 24 volt, 35 ampere unit consisting of two elements: a voltage regulator, and a load relay. The voltage regulator element controls the line voltage by means of a double set of vibrating contacts. The load relay element is controlled by the ignition switch. In operation the load relay completes the alternator field circuit in order to energize the field coil. Figure 3-25 shows the regulator sequence of operation.

b. *Removal.* Refer to figure 3-26 and remove the regulator.



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Figure 3-22. Alternator test diagrams.

c. Testing

(1) *Resistance test.* Using an ohmmeter, measure the resistance in OHMS between the terminals of the regulator (fig. 3-27). Replace defective regulator.

(2) Regulator operating voltage.

(a) The regulator operating voltage is 27.8 volts to 28.2 volts, and is obtained by adjusting the core gap (fig. 3-28).

(b) Increase the gap to increase the voltage and decrease the gap to decrease the voltage. This is done by loosening the contact block locking screw and turning the carrier block cam adjusting screw clockwise or counter-clockwise.

Note. In making any electrical setting it is not necessary to reset the point gaps or hinge gaps or any element.

(3) Gap settings.

(a) Hinge gaps are set by adjusting the armature until the specified gap is obtained, and maintained by tightening the armature locking screw (fig. 3-28).

(b) Core gaps are set by holding the armature towards the core and turning the contact block cam adjusting screw until the speci-

fied setting is obtained. Tighten the carrier block locking screw.

(c) Contact gaps are set by holding the armature TOWARDS the core on the voltage regulator and AWAY from the core on the load relay element, then adjusting the contact carrier or armature stop. Tighten the locking screw.

(d) The armatures are adjusted to float within their travel limits by bending the armature hinge springs. Then replace springs and solder the heavy jumper to the load relay contact plate.

d. *Installation.* Refer to figure 3-26 and install the regulator.

3-44. Reverse Polarity Relay

a. General.

(1) The reverse polarity relay protects the alternator rectifier cells from damage if the battery polarity is accidentally reversed.

(2) Reversed polarity can result from incorrect battery connections, slave cable connected to a positive ground electrical source, or failure to disconnect batteries, while working on electrical system, and accidentally touching hot wires to ground or other components.

b. *On vehicle testing.* Refer to figure 3-29 and test the reverse polarity relay.

c. *Adjustment.* Refer to figure 3-30 and adjust the reverse polarity relay.

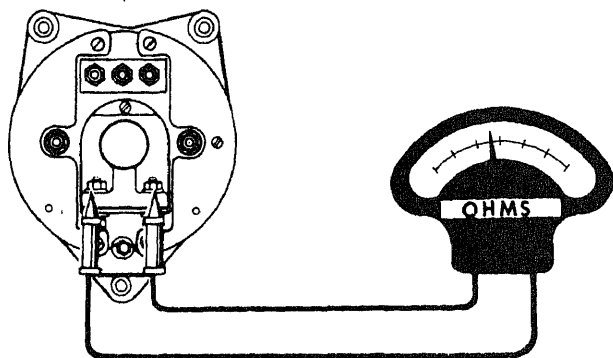
d. *Removal and Installation.* Refer to figure 3-31 to remove and install the reverse polarity relay.

3-45. Starting Motor and Solenoid Switch

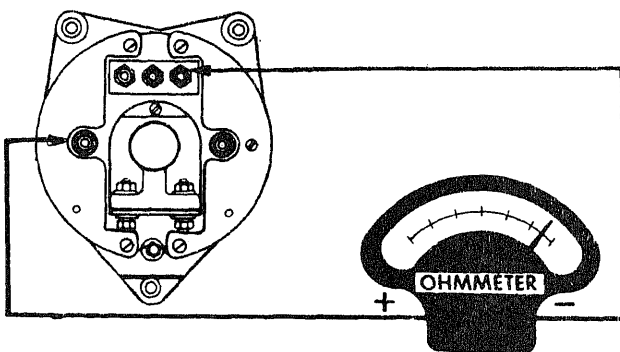
a. General.

(1) The starting motor is mounted on the left side of the flywheel housing. The starting motor is equipped with a heavy-duty sprag-type overrunning clutch.

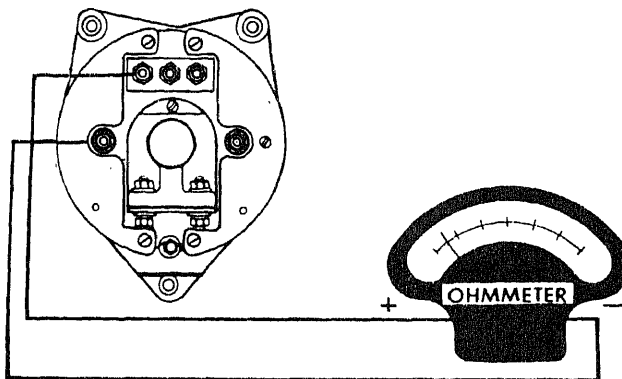
(2) A solenoid switch, mounted on the starting motor housing, operates the sprag-type overrunning clutch drive by linkage and a shift lever (fig. 3-32). When the start button is pushed, the solenoid is energized and shifts the starting motor pinion into mesh with the flywheel ring gear and closes the main contacts within the solenoid. Once engaged, the clutch will not disengage during intermittent engine firing. To protect the armature from excessive speed when the engine starts, the clutch "overruns", or turns faster than the armature, which permits the pinion to disengage itself from the flywheel ring gear.



RECTIFIER CELL TEST "A"



RECTIFIER CELL TEST NO. 1 (A)



RECTIFIER CELL TEST NO. 1 (B)

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Figure 3-28. Rectifier cell test diagrams.

b. *Removal.* Refer to figure 3-33 and remove the starting motor.

c. *Starting motor and solenoid tests.*

(1) Connect a large jumper lead across the large terminals on the solenoid.

(2) If the starter operates, the solenoid is defective. Refer to figure 3-34 and replace a defective solenoid.

(3) If the starter¹ does not operate, it is defective. Refer to figure 3-33 and replace a defective starter.

3-46. Instrument Panel and Components

a. *Removal.* Refer to figure 3-35 and remove instrument panel components as necessary.

b. *Cleaning.* Wipe gages with a clean cloth dampened with an approved cleaning solvent.

c. *Inspection.*

(1) Check gages and lights for cracked or broken glass or other damage. Replace burned-out bulbs.

(2) Inspect switches for positive action. Test switches and circuit breakers with an ohmmeter or

test lamp for continuity or high-resistance contacts.

(3) Inspect plugs and wiring harness for broken wires, frayed insulation or other damage.

(4) Replace defective components.

d. *Installation.* Refer to figure 3-35 and install instrument panel components as necessary.

3-47. Slave Receptacle

a. *General.* The slave receptacle is located next to the battery boxes. Its primary purpose is to provide a means of coupling electrical connections for cold weather starting or other auxiliary power requirements.

b. *Removal.* Refer to figure 3-36 and remove the slave receptacle.

c. *Inspection.*

(1) Inspect cover for damaged threads, and gasket wear or deterioration.

(2) Inspect cable leads for damaged insulation, broken wires, and clean battery terminals.

(3) Remove any corrosion from inside receptacle terminals.

(4) Replace a defective receptacle.

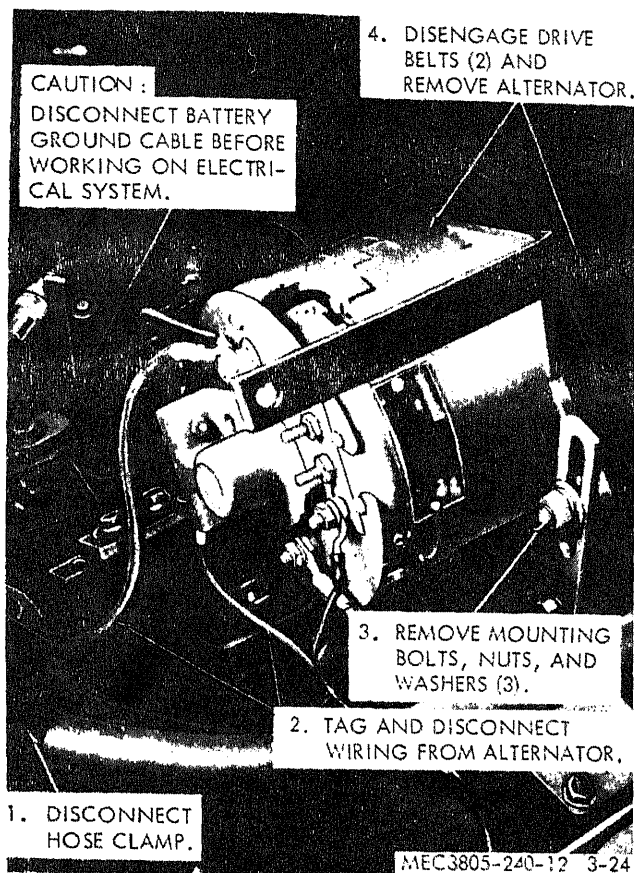


Figure 3-24. Alternator, removal and installation.

d. *Installation.* Refer to figure 3-36 and install the slave receptacle.

3-48. Turn Signal Assembly

a. *Inspection and Repair.*

(1) Check mounting clamp for tightness and damage. Replace a defective clamp.

(2) Operate lever and check function of all lights and flasher unit. Replace defective flasher or lamps.

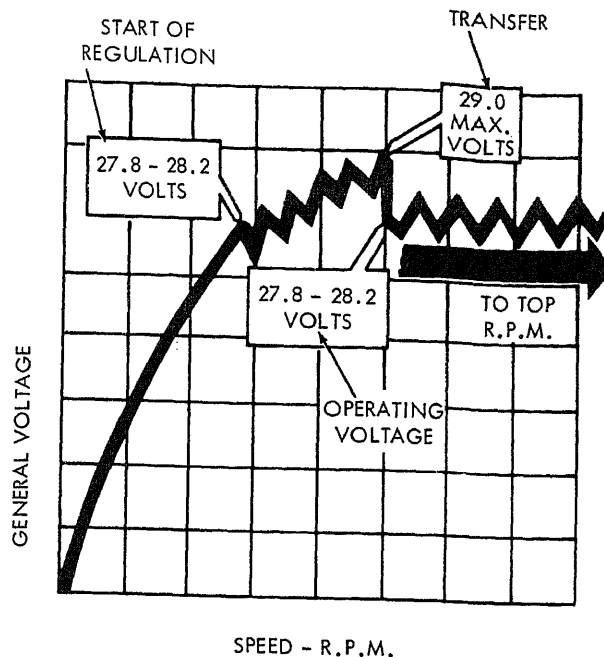
(3) Inspect wiring harness for frayed insulation and broken wires. Repair damaged insulation.

(4) Inspect housing and lever assemblies for wear or damage. Replace a defective turn signal assembly.

b. *Removal.* Refer to figure 3-37 and remove the turn signal assembly.

c. *Disassembly.* Disassemble the turn signal assembly in the numerical sequence as illustrated on figure 3-38.

d. *Reassembly.* Reassemble the turn signal assembly in reverse of the numerical sequence as



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Figure 3-25. Regulator sequence of operation.

e. *Installation.* Refer to figure 3-37 and install the turn signal assembly.

3-49. Lights

a. *Inspection and Cleaning.*

(1) Inspect all lights regularly for burned-out lamps, secure mounting, proper connections, broken lenses, or damaged bodies. Replace lamps or light assemblies as required.

(2) Keep lenses and sealed beam lights clean for maximum visibility and safety.

b. *Head Light.*

(1) *Removal.*

(a) Remove the light housing cover (para 3-107).

(b) Refer to figure 3-39 and remove the head light assembly.

(2) *Installation.* Refer to figure 3-39 and install the head light assembly.

(3) *Lamp replacement.* Refer to figure 3-40 and replace the lamp.

c. *Service Combination Light.*

(1) *Removal.* Refer to figure 3-41 and re-



1. TAG AND DISCONNECT WIRES

MEC3805-240-12/3-26

Figure 3-26. Regulator removal and installation.

(2) *Installation.* Refer to figure 3-41 and install the service combination light assembly.

(3) *Lamp replacement.* Refer to figure 3-42 and replace the lamp.

d. Blackout Headlight.

(1) *Removal.* Refer to figure 3-43 and remove the blackout headlight assembly.

(2) *Installation.* Refer to figure 3-43 and install the blackout head light assembly.

(3) *Lamp replacement.* Refer to figure 3-44 and replace the sealed lamp assembly.

e. Blackout Marker Light.

(1) *Removal.* Refer to figure 3-43 and remove the blackout marker light assembly.

(2) *Installation.* Refer to figure 3-43 and install the blackout marker light assembly.

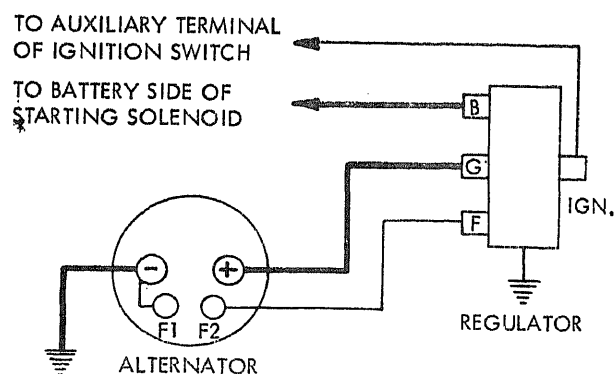
(3) *Lamp replacement.* Refer to figure 3-45 and replace the lamp.

f. Clearance Marker Light.

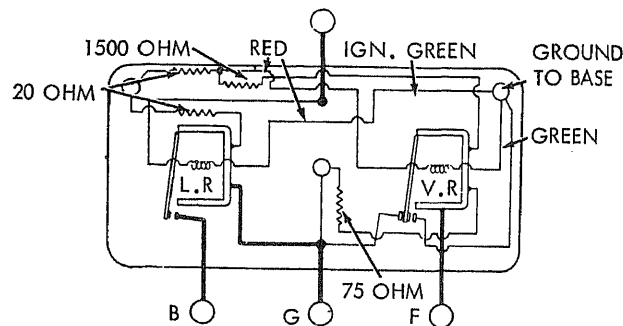
(1) *Removal.* Refer to figure 3-46 and remove the clearance light assembly.

(2) *Installation.* Refer to figure 3-46 and install the clearance marker light.

Note. Blackout clearance marker lights must be installed so the small bump on the lens is at the top.



EXTERNAL WIRING DIAGRAM



INTERNAL WIRING DIAGRAM

MEC3805-240-12/3-27

Figure 3-27. Regulator wiring diagram.

(3) *Lamp replacement.* Refer to figure 3-47 and replace the lamp.

g. Panel Light.

(1) *Removal.* Refer to figure 3-48 and remove the panel light assembly.

(2) *Installation.* Refer to figure 3-48 and install the panel light assembly.

(3) *Lamp replacement.* Refer to figure 3-49 and replace the lamp.

h. Rear Blackout Combination Light.

(1) *Removal.* Refer to figure 3-50 and remove the rear blackout combination light assembly.

(2) *Installation.* Refer to figure 3-50 and install the rear blackout combination light assembly.

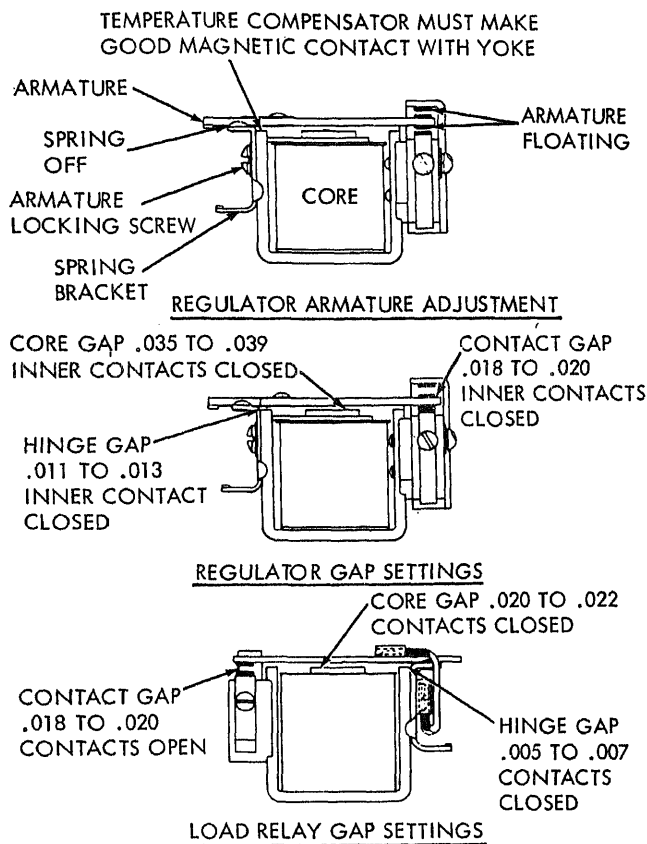
(3) *Lamp replacement.* Refer to figure 3-51 and replace the lamps.

i. Floodlight.

(1) *Removal.* Refer to figure 3-52 and remove the floodlight.

(2) *Installation.* Refer to figure 3-52 and install the flood light.

(3) *Lamp replacement.* Refer to figure 3-53 and replace the lamp.



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Figure 3-28. Regulator gap settings.

j. Transmission Gear Shift Light.

- (1) *Removal.* Refer to figure 3-54 and remove the transmission gear shift light assembly.
- (2) *Installation.* Refer to figure 3-54 and install the transmission gear shift light assembly.
- (3) *Lamp replacement.* Refer to figure 3-54 and replace the lamp.

3-50. Sending Units and Warning Switches

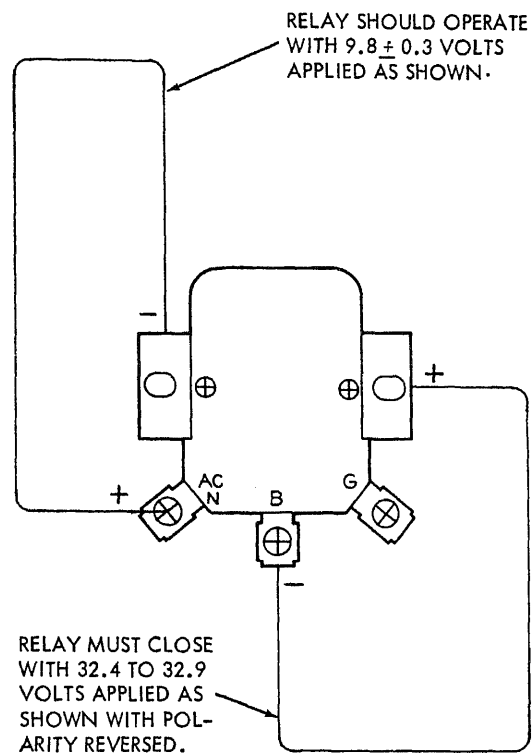
a. Pneumatic Pressure Switches.

(1) General.

(a) The pneumatic pressure switches operate electrical contacts by means of changing air pressure in various parts of the air system.

(b) The function and location of the pressure switches is as follows:

1. Stop light switch: on firewall, next to the voltage regulator (fig. 3-55).
2. Low pressure buzzer switch: on firewall next to the starting aid cylinder (fig. 3-56).
3. Parking brake-on light switch: on cab wall behind driver's seat (fig. 3-57).
4. Interaxle lock-up warning light switch: on cab wall behind driver's seat (fig. 3-57).



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Figure 3-29. Reverse polarity relay test diagram.

(2) Inspection.

(a) Check the switches, tubing, and fittings for leaks or damage. Replace defective switches.

(b) Inspect wiring for proper connections, worn or deteriorated insulation, or broken wires.

(c) Tighten loose mounting bolts.

(3) *Removal.* Refer to figures 3-55, 3-56, and 3-57 and remove the pressure switch assembly.

(4) *Installation.* Refer to figures 3-55, 3-56, and 3-57 and install the pressure switch assembly.

b. Low Air Pressure Warning Buzzer.

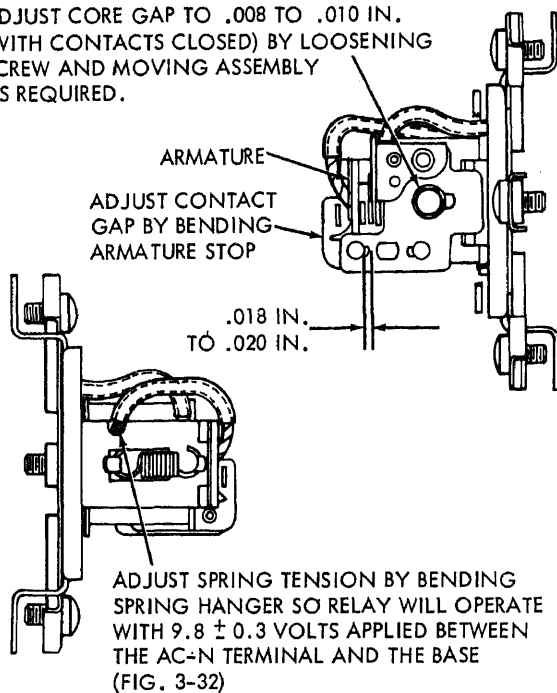
(1) *General.* The low air pressure warning buzzer is located above the cab vent on the driver's side of the operating compartment. When the electrical contacts close in the low pressure buzzer switch, the electric buzzer is energized.

(2) Inspection.

(a) Inspect the wiring for loose connections, worn or deteriorated insulation, and broken wires.

(b) Inspect buzzer for damage and tighten loose mounting nuts. Replace a defective buzzer.

ADJUST CORE GAP TO .008 TO .010 IN. (WITH CONTACTS CLOSED) BY LOOSENING SCREW AND MOVING ASSEMBLY AS REQUIRED.



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Figure 3-30. Reverse polarity relay gap settings.

(3) Removal.

- (a) Tag and disconnect lead.
- (b) Remove mounting nuts (3) and lockwashers (3).
- (c) Remove buzzer.
- (4) *Installation.* Install by reversing steps for removal.

c. Engine Oil Low Pressure Switch.

(1) *General.* When engine oil pressure falls below operating range, the engine oil low pressure switch turns on the low pressure warning light above the engine pressure gage on the instrument panel. The switch is connected to the right-hand oil gallery next to the engine oil filter.

(2) Inspection.

- (a) Inspect switch for oil leaks or damage. Replace a defective switch.
- (b) Check wiring connections and insulation for wear or deterioration.

(3) *Removal.* Refer to figure 3-58 and remove the pressure switch assembly.

(4) *Installation.* Refer to figure 3-58 and install the pressure switch assembly.



1. TAG AND DISCONNECT CABLE (3).
2. REMOVE MOUNTING SCREW (2).
3. REMOVE REVERSE POLARITY RELAY.

MEC3805-240-12 /3-31

Figure 3-31. Reverse polarity relay, removal and installation.

d. Alternator Interlock Pressure Switch.

(1) *General.* The alternator interlock pressure switch delays energization of the alternator field until the engine has started and oil pressure risen enough to close contacts in the switch. The interlock pressure switch is connected to the left-hand oil gallery above the starting motor.

(2) Inspection.

(a) Inspect the wiring for loose connections, worn or deteriorated insulation, and broken wires.

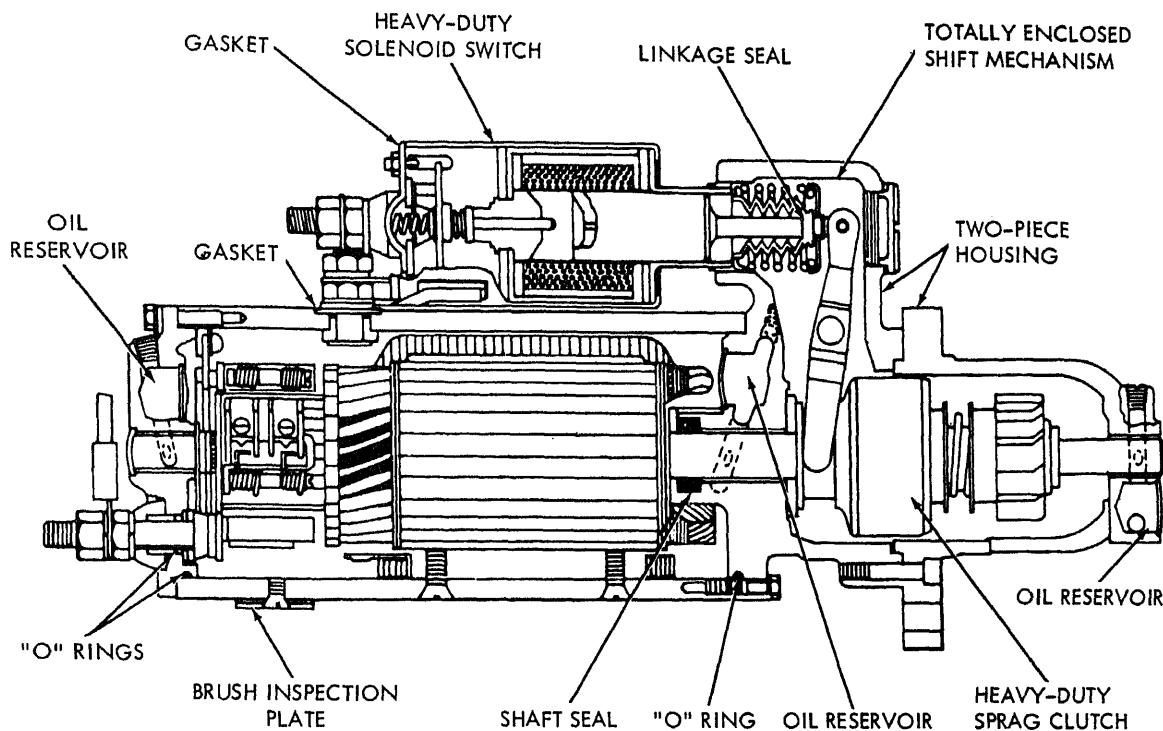
(b) Inspect the switch for oil leaks or damage. Replace a defective switch.

(3) *Removal.* Refer to figure 3-59 and remove the interlock pressure switch.

(4) *Installation.* Refer to figure 3-59 and install the interlock pressure switch.

e. Water Temperature Warning Light Switch.

(1) *General.* When the water exceeds normal operating temperatures, the water temperature warning switch turns on the light above the water temperature gage. The switch is threaded into the left-hand thermostat housing.



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Figure 3-32. Starting motor, cross-section.

(2) *Inspection.*

(a) Inspect wiring for good connections, worn or deteriorated insulation, and broken wires.

(b) Inspect switch for water leaks and visible damage. Replace a defective switch.

(3) *Removal.* Refer to figure 3-60 and remove the water temperature warning light switch.

(4) *Installation.* Refer to figure 3-60 and install the water temperature warning light switch.

f. Fuel Level Indicator Unit.

(1) *General.* The fuel level indicator unit is mounted on top of the fuel tank. A float rises and lowers with the level of the fuel to operate a mechanical gage on the fuel tank and the electrical gage on the instrument panel.

(2) *Inspection.*

(a) Inspect wiring for good connections, worn or deteriorated insulation, and broken wires.

(b) Inspect float for free operation.

(c) Inspect indicator unit for leaks or damage. Replace a defective indicator unit.

(3) *Removal.* Refer to figure 3-61 and remove the fuel level indicator unit.

(4) *Installation.* Refer to figure 3-61 and install the fuel level indicator unit.

3-51. Horn

a. General.

(1) The horn is actuated by the horn button on the instrument panel. An electric valve opens and allows compressed air to operate the horn.

(2) The horn is mounted on the front of the cab on the driver's side.

b. Inspection.

(1) Inspect horn for damage. Tighten loose mounting screws. Replace a defective horn.

(2) Inspect air hose and fittings for leaks or damage. Replace defective parts.

(3) Inspect wiring for good connections, worn or deteriorated insulation, and broken wires. Repair or replace defective wiring.

c. Removal. Refer to figure 3-62 and remove the horn.

d. Installation. Refer to figure 3-62 and install the horn.

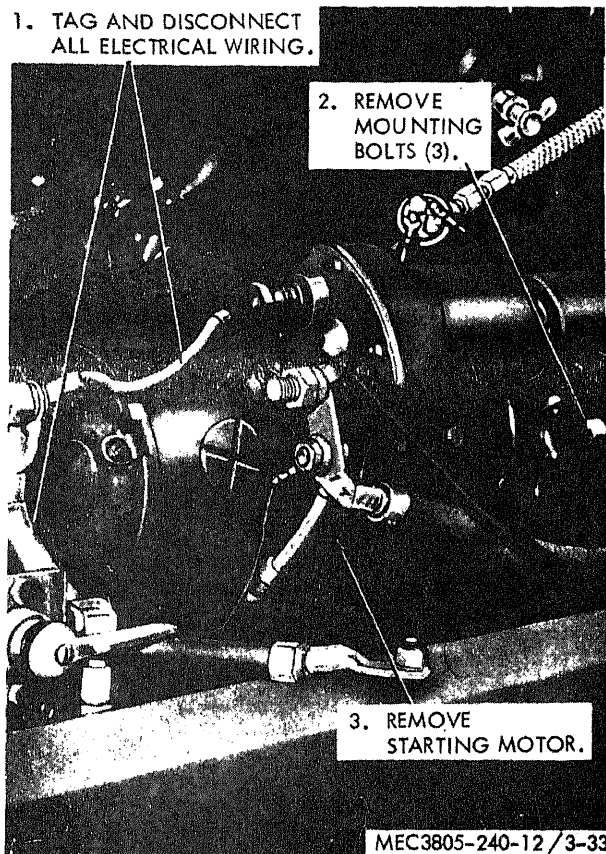


Figure 3-33. Starting motor removal and installation.

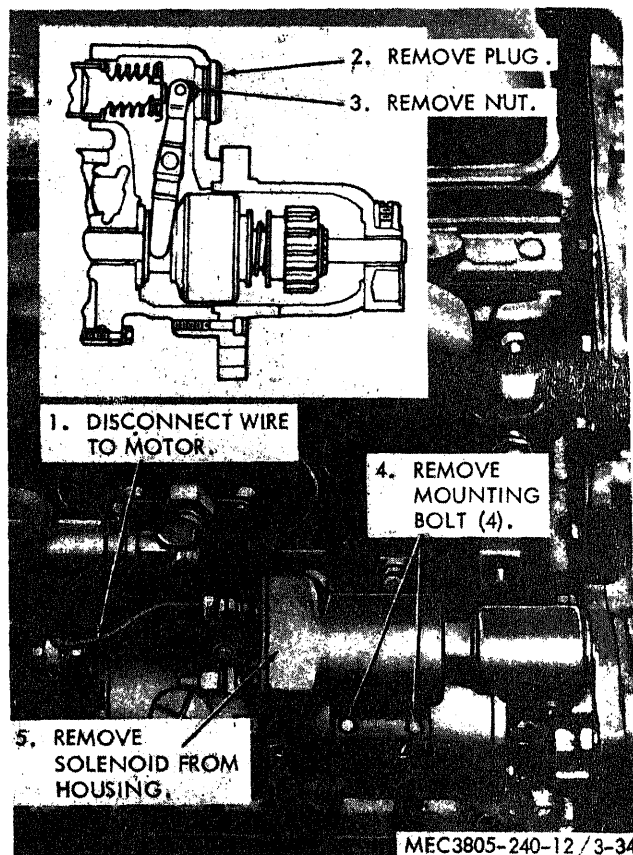


Figure 3-34. Solenoid removal and installation.

3-52. Batteries

a. General.

(1) There are two pairs of 12 volt BB-248/U (6TN) batteries connected in series. The pairs are then joined in parallel to produce 24 volts DC with negative ground.

(2) The batteries are located on the right-hand side of the ditcher directly in front of the rear wheel.

Warning: Batteries generate hydrogen, a highly flammable gas. Do not allow sparks or open flames near batteries. Do not lay tools across battery terminals to avoid sparks. If electrolyte spills on hands or clothing, wash thoroughly with water.

b. Removal. Refer to figure 3-63 and remove the batteries.

c. Cleaning.

(1) Clean the batteries with a solution of baking soda or ammonia to neutralize acid on the surface.

Caution: Do not allow cleaning solution to enter the battery.

(2) Remove corrosion from battery cables and box and neutralize in a manner similar to instructions for batteries.

d. Inspection and Repair.

(1) Inspect the batteries for cracked case, badly burned posts, or other damage. Replace defective battery.

(2) Test the batteries with a hydrometer. If the specific gravity reads below 1.225, recharge the battery. Test the battery again after recharging. A new, fully charged battery should read approximately 1.280. Replace a battery that will not take or hold a charge.

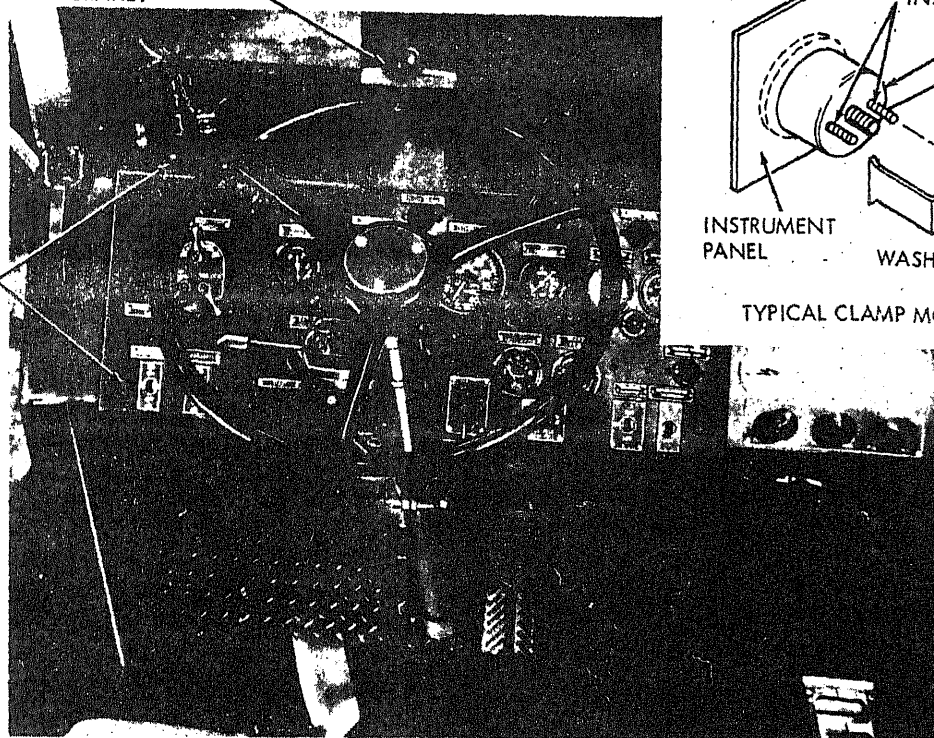
(3) Inspect battery cables for badly corroded or loose terminals, extensive deterioration of insulation, or other damage. Tape breaks or cuts in insulation. Replace badly damaged cables.

e. Installation. Refer to figure 3-63 and install the batteries.

Caution: Do not overtighten wing nuts on the battery retainers to avoid warping or cracking the battery case.

2. REMOVE MOUNTING BOLT (4) AND REMOVE STEERING FRICTION BRAKE.

3. REMOVE MOUNTING BOLT (5) AND SEPARATE INSTRUMENT PANEL FROM DASH BOARD.



1. DISCONNECT WIRING HARNESS.

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Figure 3-35(1). Instrument panel components, removal and installation.

3-53. Wiring

a. General. Electrical current is supplied to all components in the electrical system by means of cables, wiring harnesses, and leads. Wiring is protected from damage and shorting by insulation, tape, rubber grommets, padded clamps, and water proof connectors.

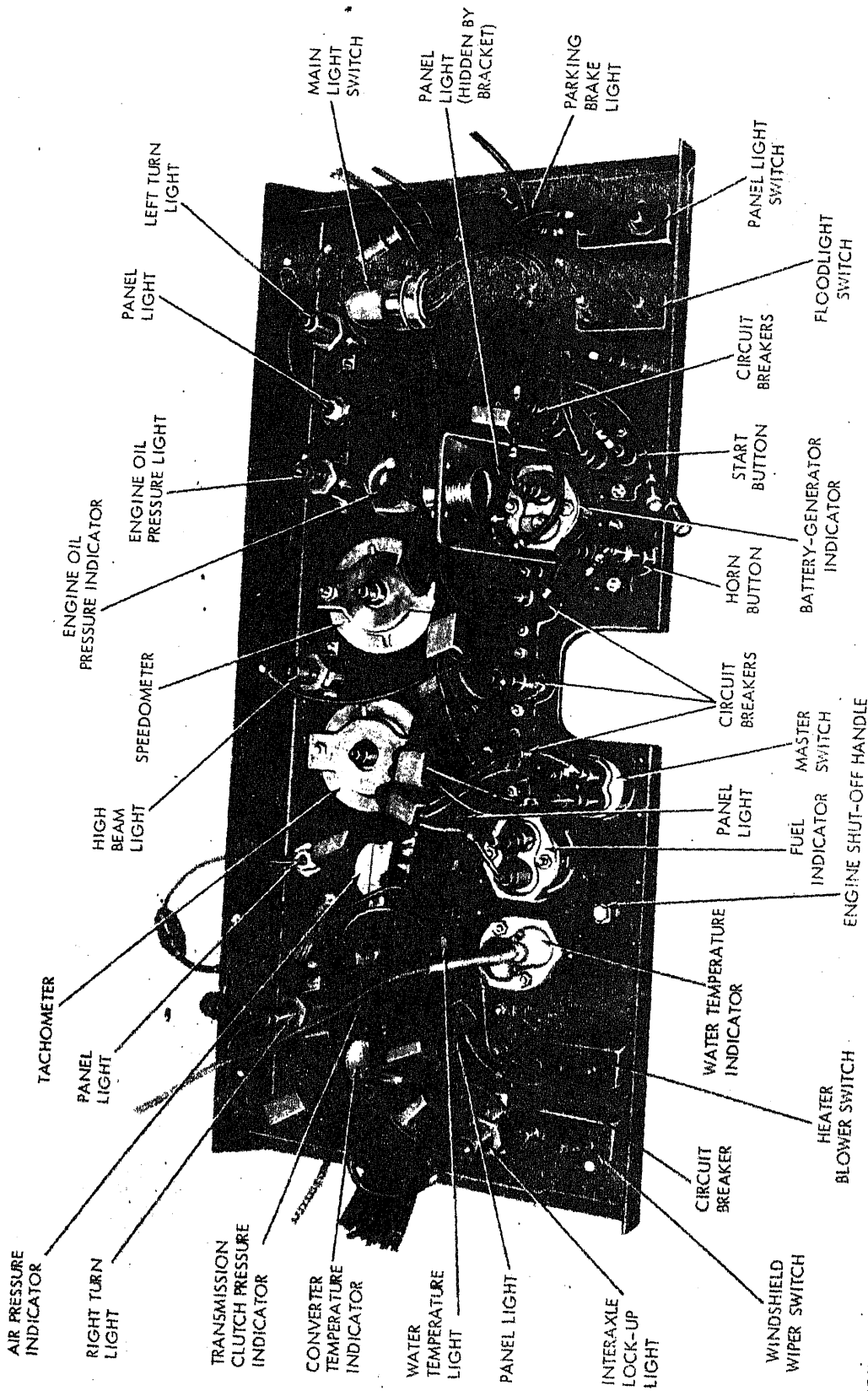
b. Inspection and Repair.

- (1) Inspect wiring for damaged insulation,

broken wires or loose connectors. Repair damaged insulation with tape. Mend broken wires and loose connections where practical.

(2) Inspect clamps for damage and tight mounting screws. Check grommets for deterioration or damage. Replace defective parts.

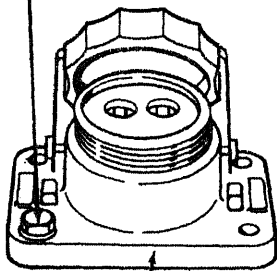
(3) Inspect waterproof connectors for cracking, hardening, or damage. Replace defective connectors.



NOTE: TAG AND DISCONNECT LEADS. REMOVE MOUNTING HARDWARE AS NECESSARY TO REMOVE DAMAGED COMPONENTS.

Figure 8-95(2)—Continued.

3. REMOVE MOUNTING
BOLT (4).



4. REMOVE SLAVE
RECEPTACLE
AND LEADS

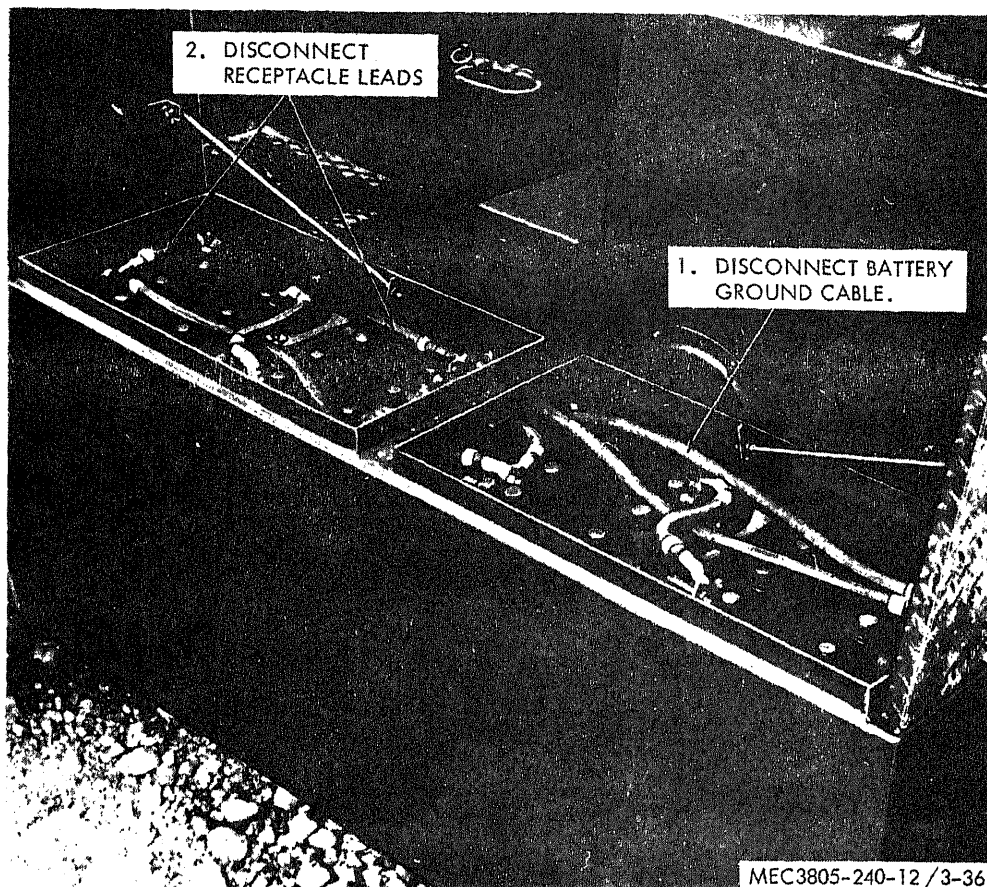
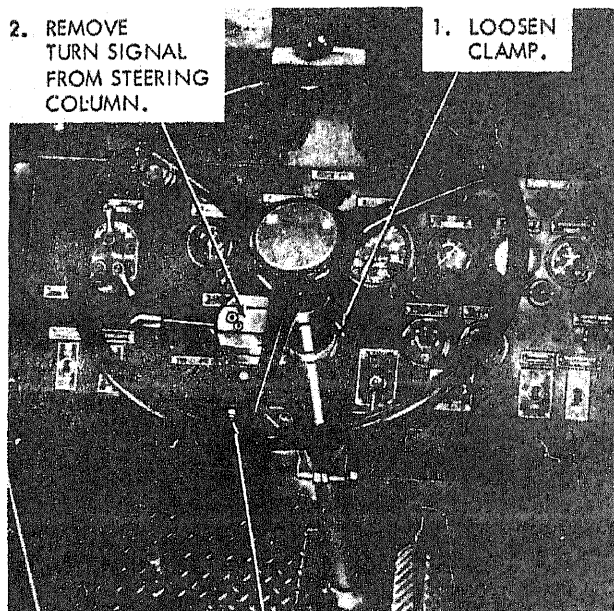


Figure 3-36. Slave receptacle, removal and installation.

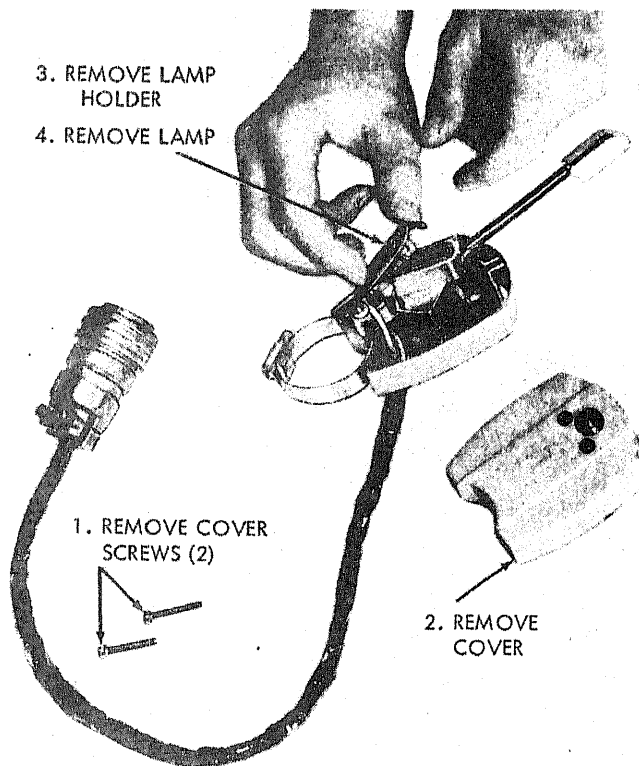


3. DISCONNECT WIRING HARNESS

4. REMOVE TURN SIGNAL ASSEMBLY.

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Figure 3-37. Turn signal assembly, removal and installation.



3. REMOVE LAMP HOLDER

4. REMOVE LAMP

1. REMOVE COVER SCREWS (2)

2. REMOVE COVER

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Figure 3-38. Turn signal disassembly and reassembly.

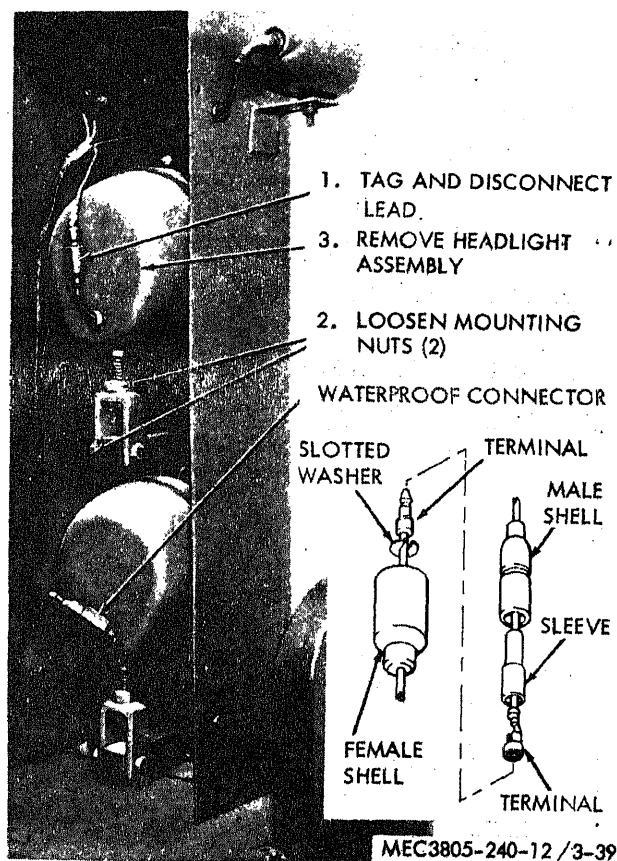
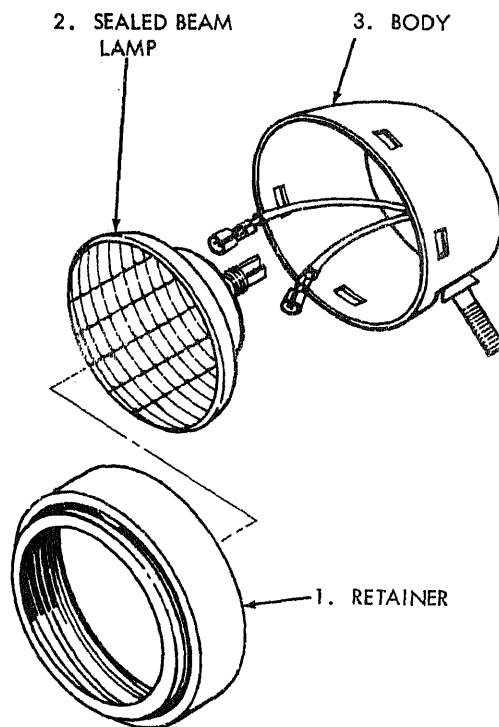


Figure 3-39. Head lights, removal and installation.



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Figure 3-40. Head light lamp replacement.

1. TAG AND DISCONNECT LEADS (2).

2. REMOVE MOUNTING SCREWS (3),
NUTS (3), AND LOCKWASHERS (3).

3. REMOVE SERVICE COM-
BINATION LIGHT
ASSEMBLY.

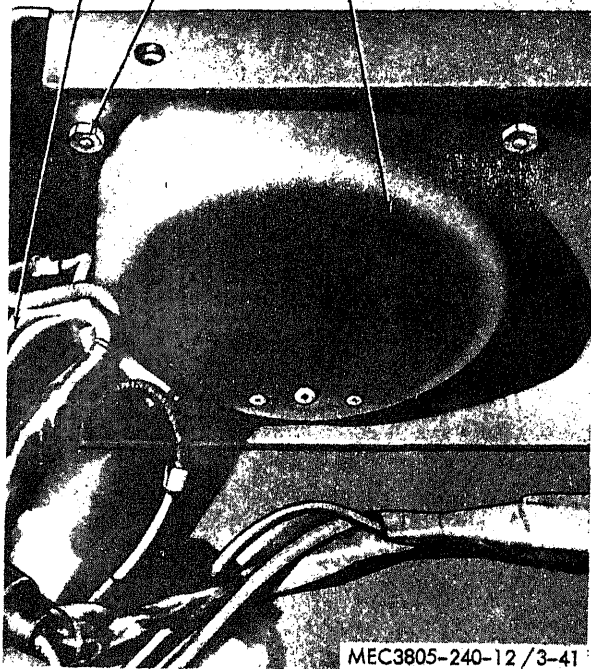
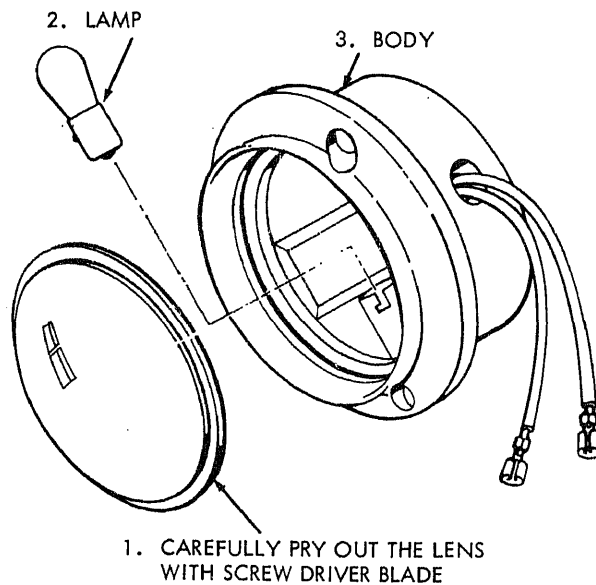


Figure 3-41. Service combination light, removal and installation.



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Figure 3-42. Service combination lamp replacement.

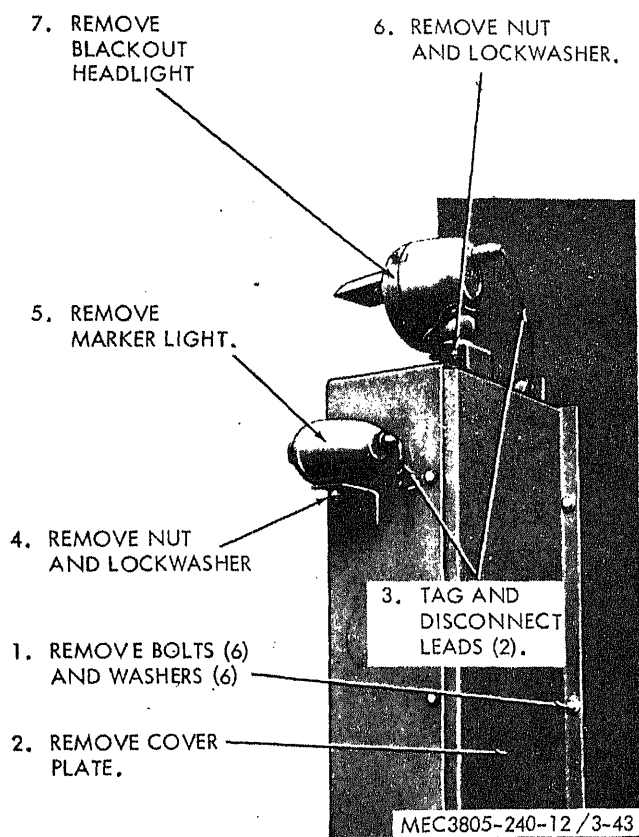
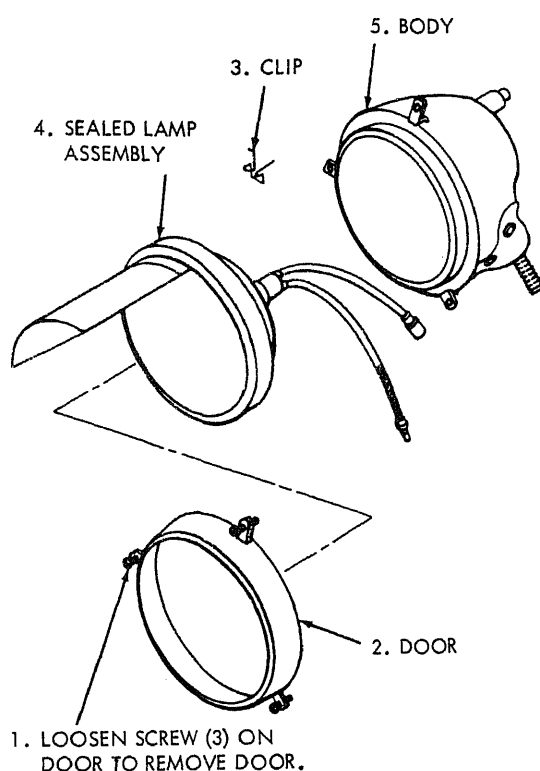
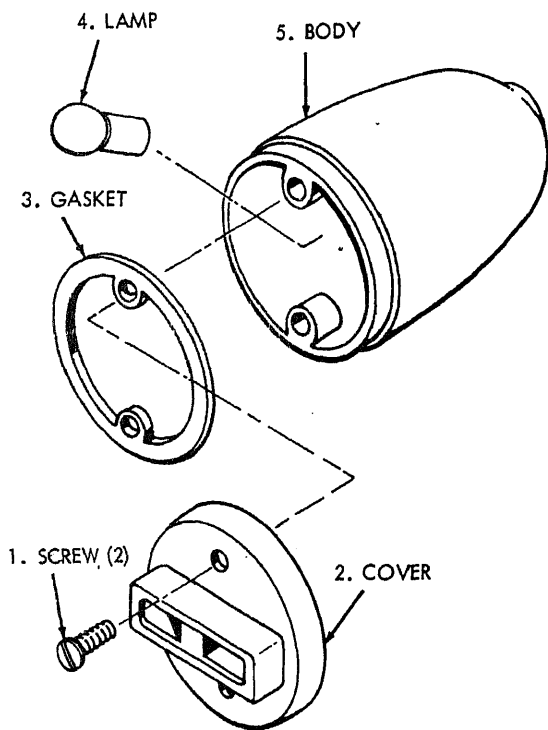


Figure 3-43. Blackout headlight and blackout marker light, removal and installation.



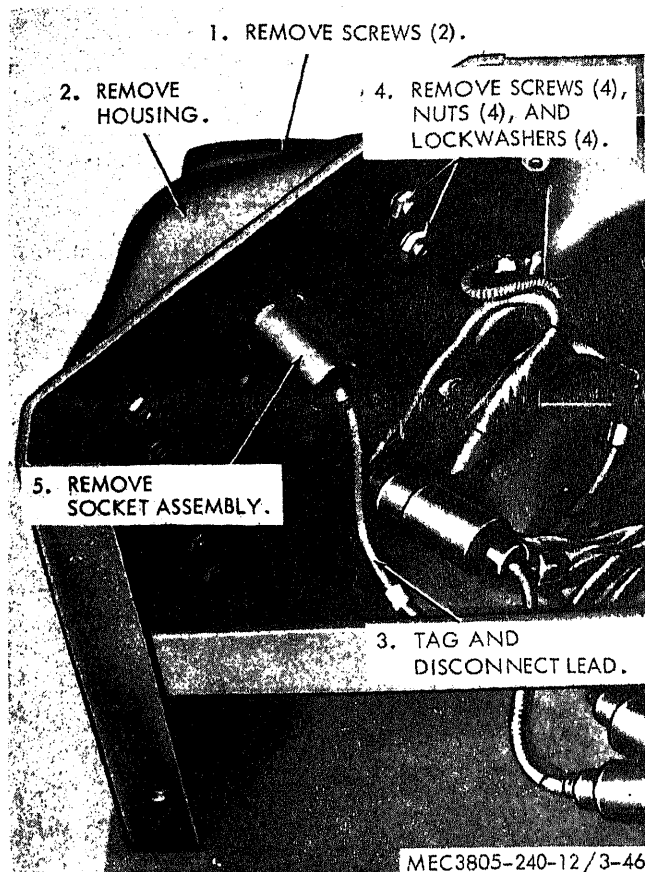
MEC3805-240-12 / 3-44

Figure 3-44. Blackout head light lamp replacement.



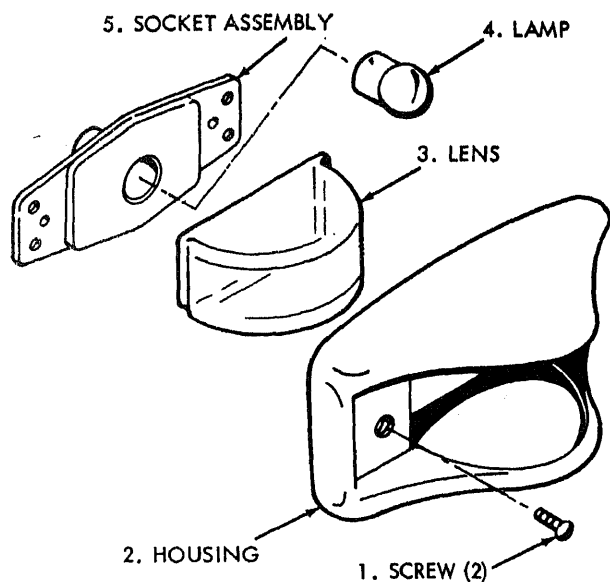
MEC3805-240-12 / 3-45

Figure 3-45. Blackout marker lamp replacement.



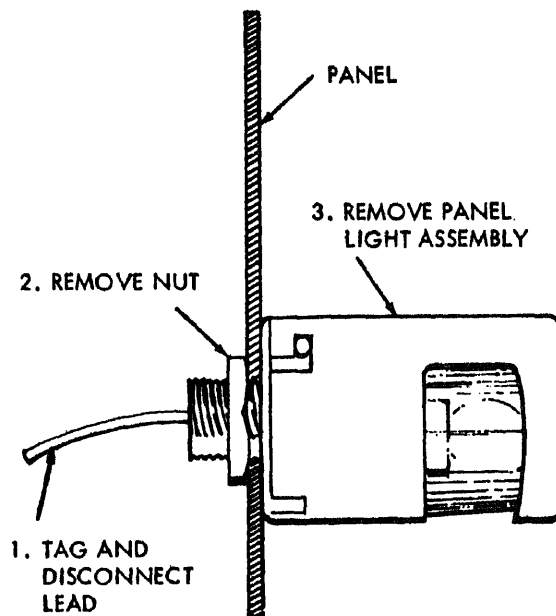
MEC3805-240-12 / 3-46

Figure 3-46. Clearance marker light, removal and installation.



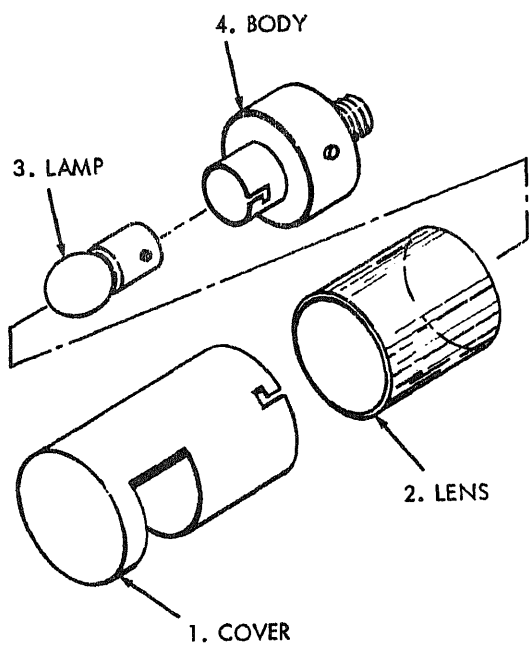
MEC3805-240-12 /3-47

Figure 3-47. Clearance marker lamp replacement.



MEC3805-240-12 /3-48

Figure 3-48. Panel light, removal and installation



MEC3805-240-12 / 3-49

Figure 3-49. Panel lamp replacement.

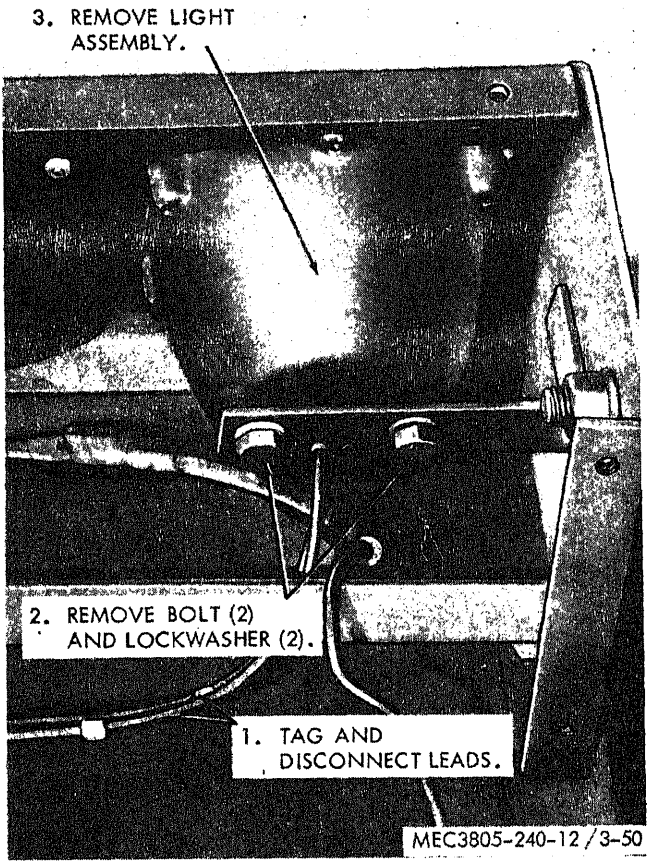
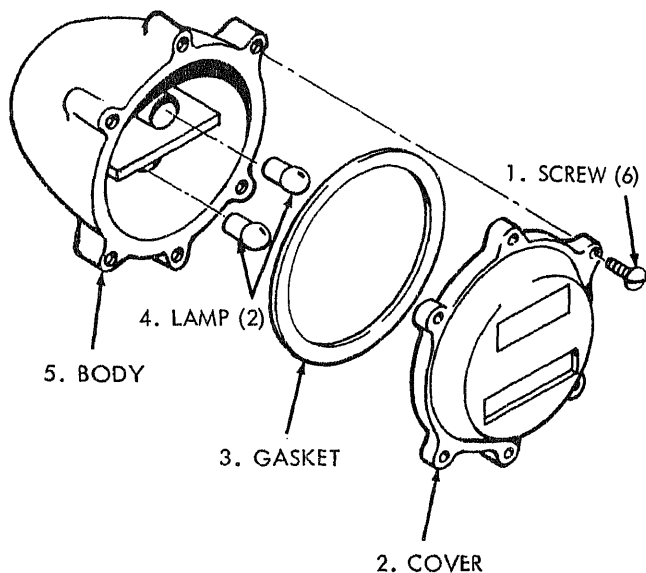


Figure 3-50. Rear blackout combination light, removal and installation.



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Figure 3-51. Rear blackout combination lamp replacement.

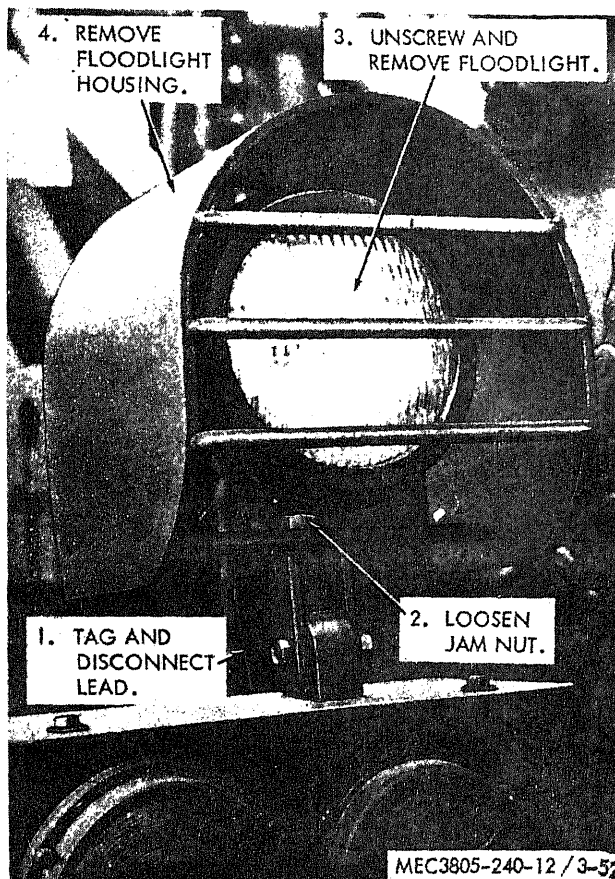
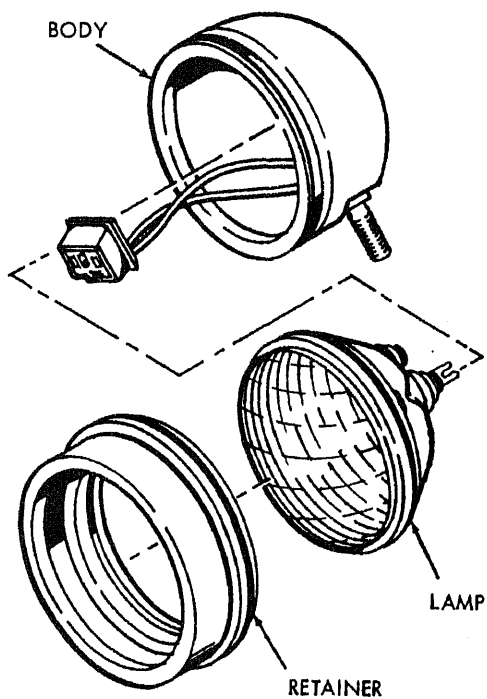


Figure 3-52. Floor light, removal and installation.



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Figure 3-53. Flood light lamp replacement.

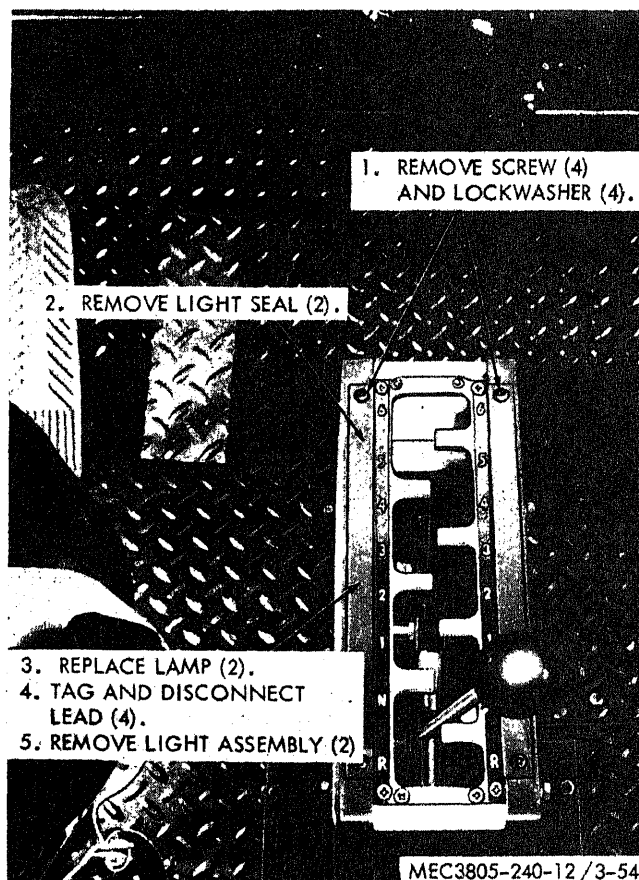


Figure 3-54. Transmission gear shift light; removal, installation and lamp replacement.

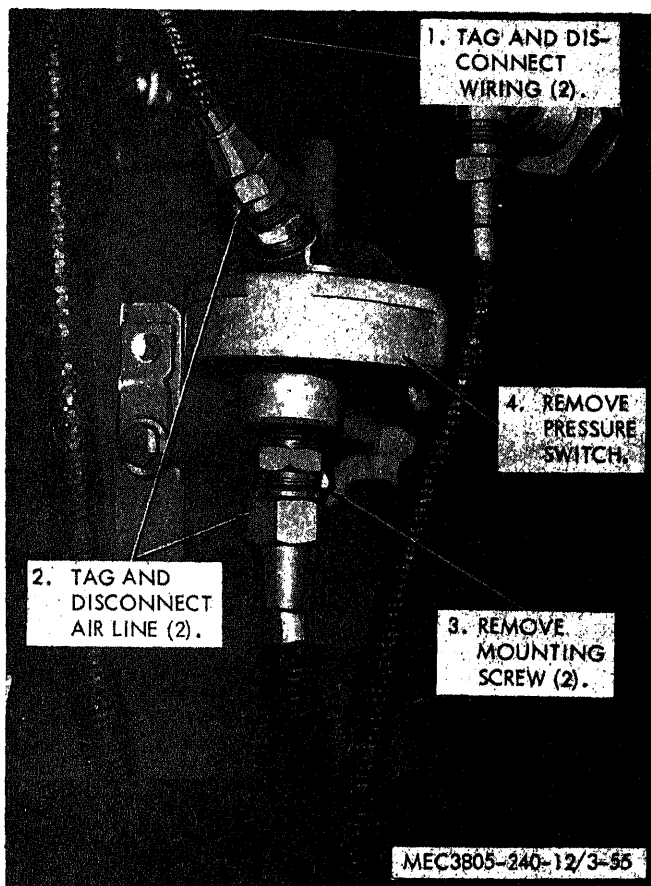


Figure 3-55. Stop light switch, removal and installation.

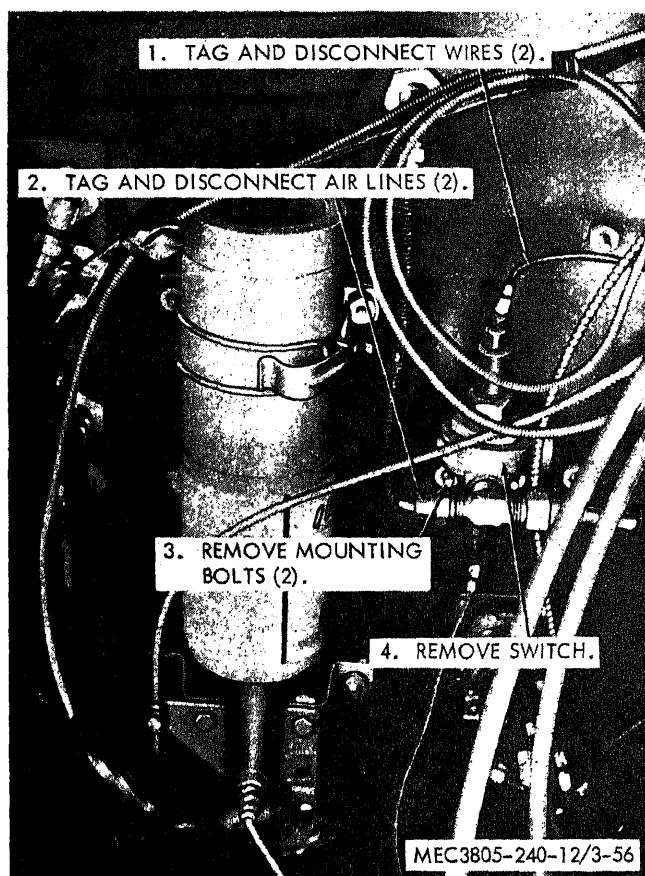


Figure 3-56. Buzzer switch, removal and installation.

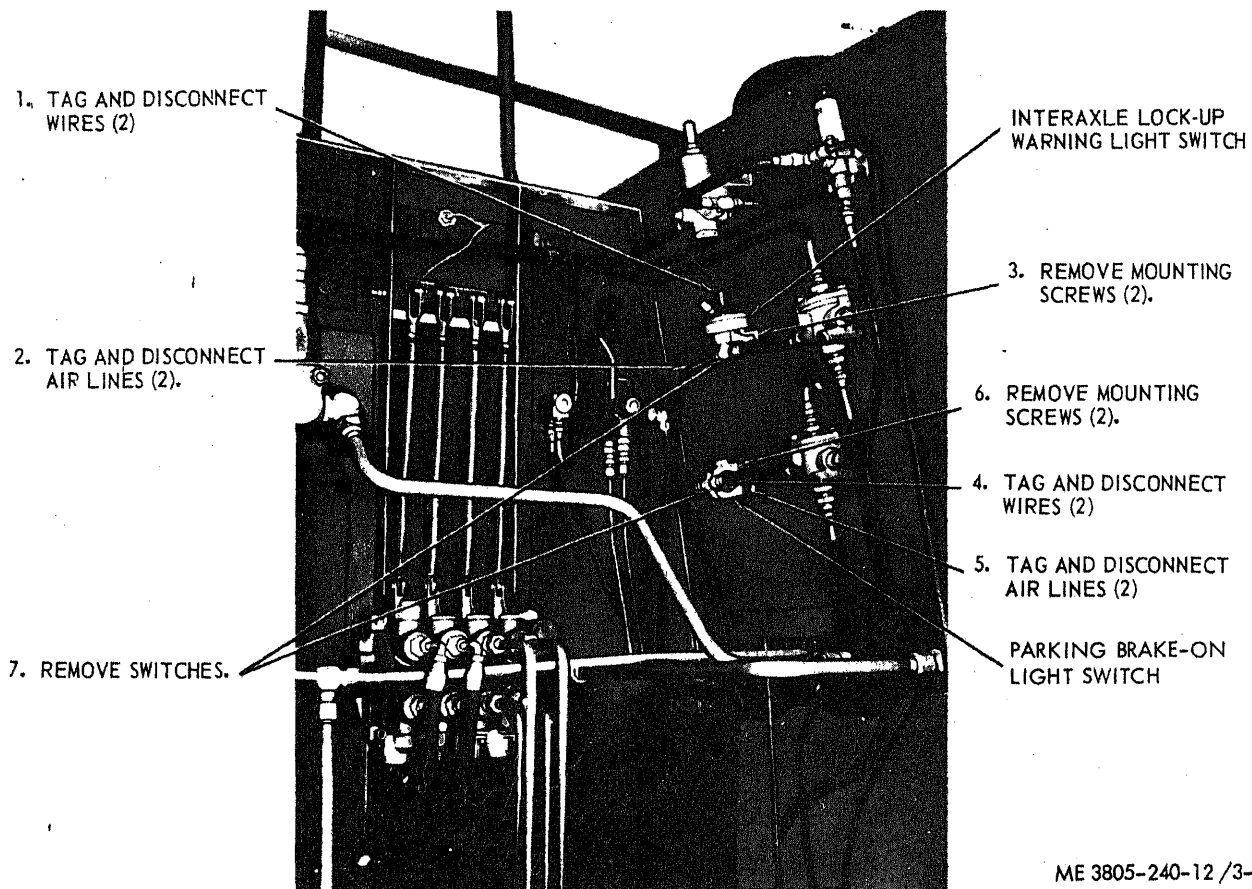


Figure 8-57. Interaxle lock-up and parking light switch, removal and installation.

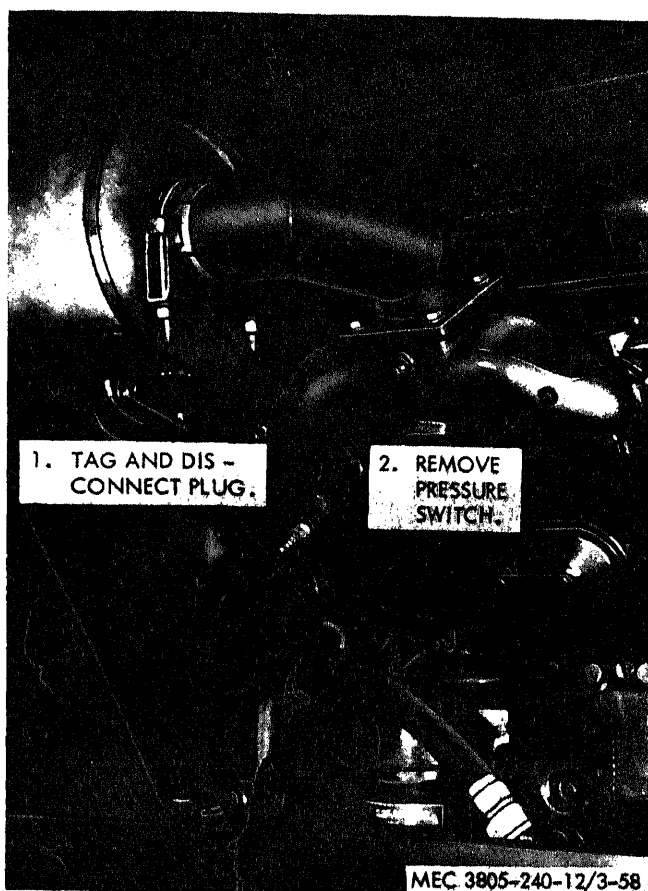


Figure 3-58. Engine oil low pressure switch, removal and installation.

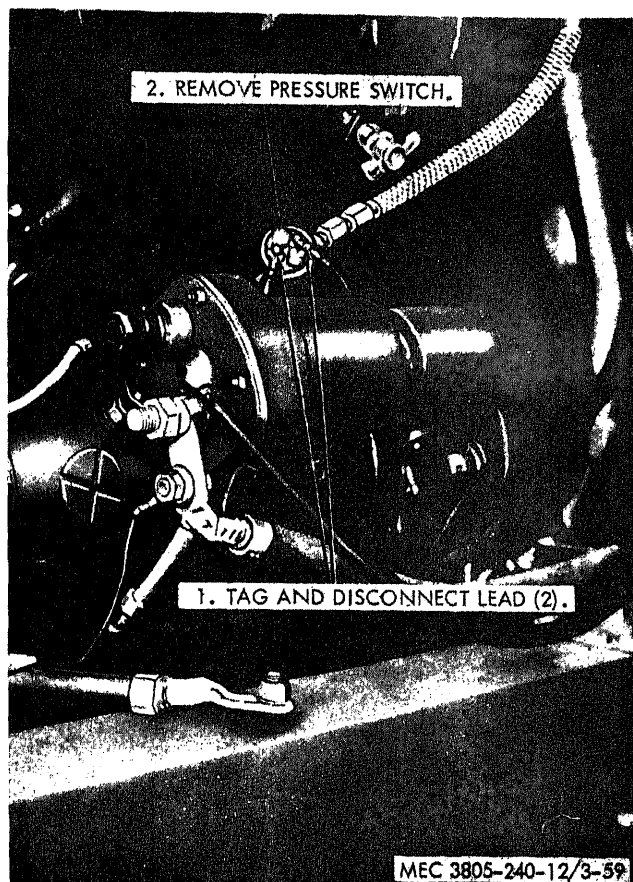


Figure 3-59. Alternator interlock pressure switch, removal and installation.

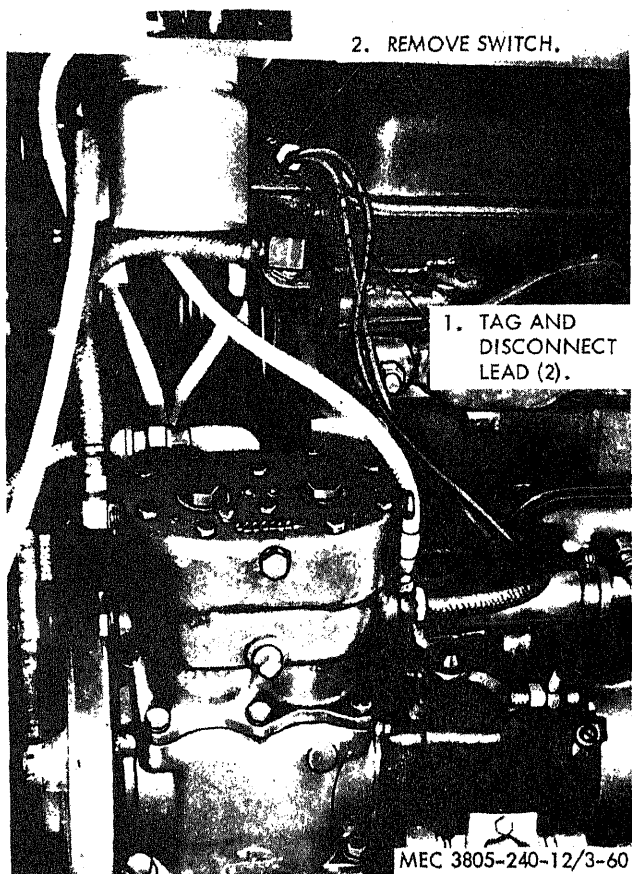


Figure 3-60. Water temperature warning light switch, removal and installation.

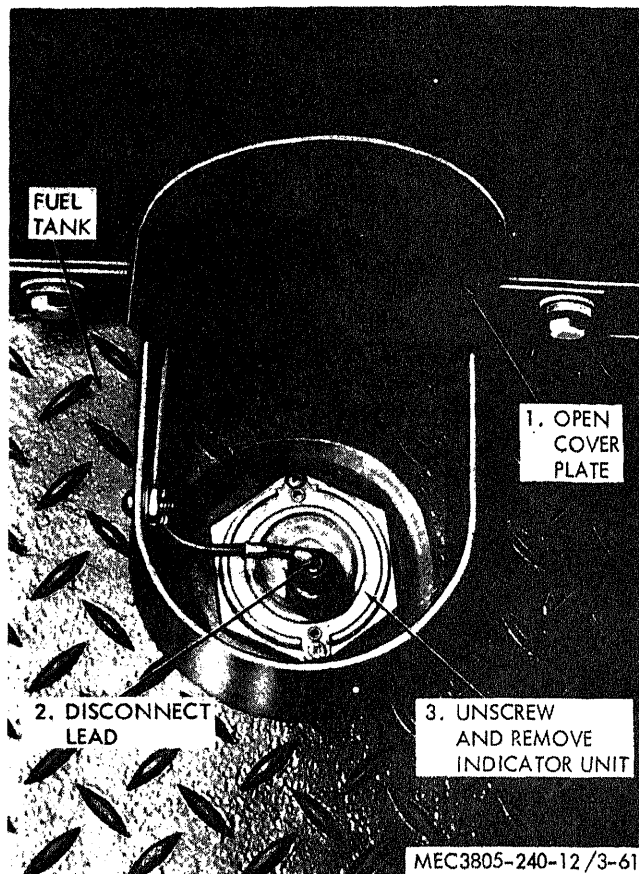


Figure 3-61. Fuel level indicator unit, removal and installation.

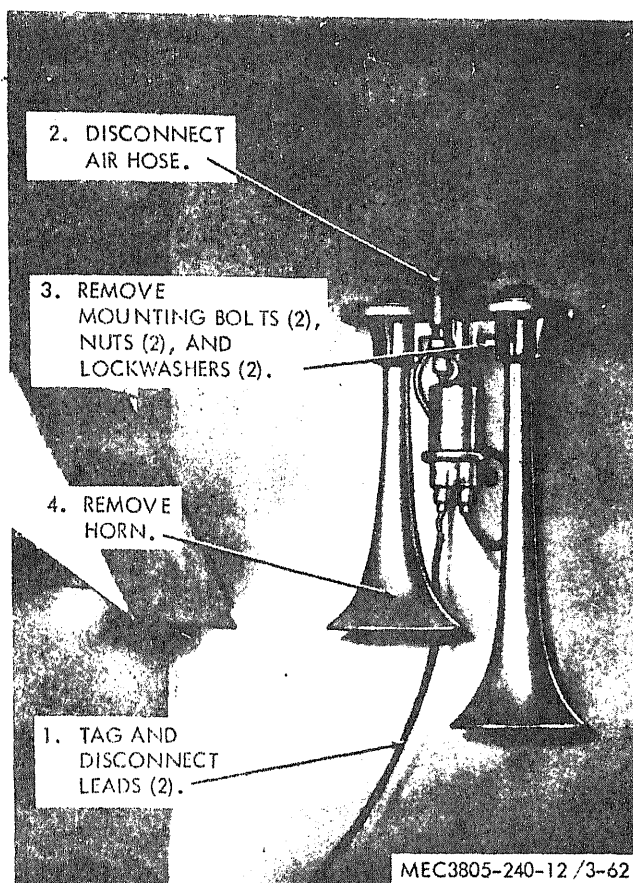


Figure 3-62. Horn, removal and installation.

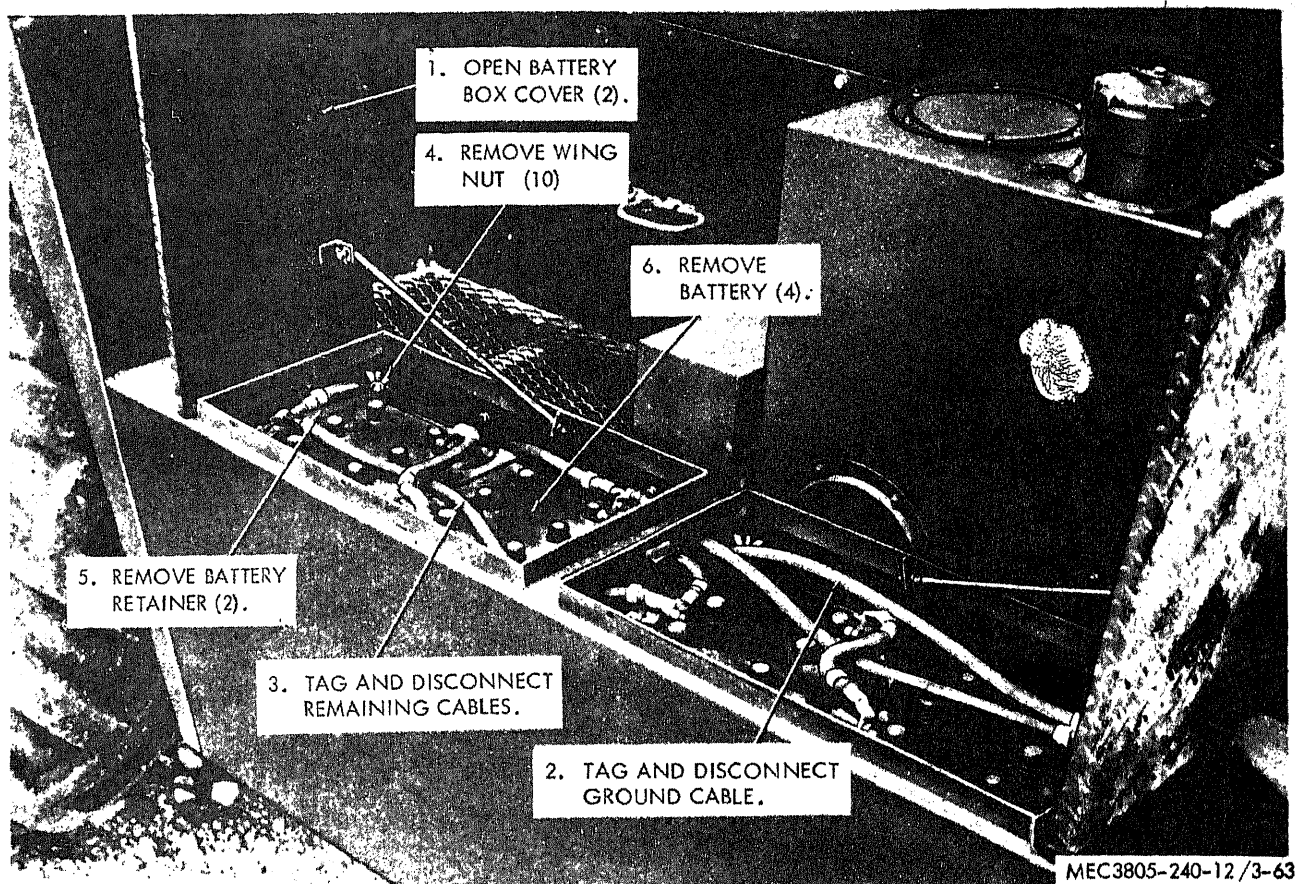


Figure 3-63. Batteries, removal and installation.

Section IX. HYDRAULIC SYSTEM

3-54. General

The hydraulic system is made up of three circuits: the crowd drive circuit, the conveyor belt circuit, and the steering power assist, conveyor shift, and cylinder circuit. An oil tank, oil cooler, three pumps, four motors, five cylinders, connecting lines and control valves complete the system.

Warning: Lower the boom until it rests on the ground before doing any work on the hydraulic system.

3-55. Tank

a. Service.

(1) Remove filler cap, drain plug (fig. 3-66), and drain tank.

(2) Refer to figure 3-66 and remove tank access covers.

(3) Refer to figure 3-67 and remove filters and strainer assembly.

(4) Clean inside of tank with an approved solvent. Dry inside of tank completely with compressed air.

(5) Refer to figure 3-67 and install new filters.

(6) Refer to figure 3-66 and install tank access covers.

(7) Clean filler cap and strainer screen in approved solvent. Dry with compressed air.

(8) Refer to figure 3-65 and install drain plug.

(9) Refill tank with 55 gallons oil in accordance with the current lubrication order.

b. Inspection.

(1) Inspect fill cap for free operation and damage.

(2) Inspect dipstick for free operation and damage.

(3) Inspect relief valve for damage and proper operation. Replace a defective relief valve.

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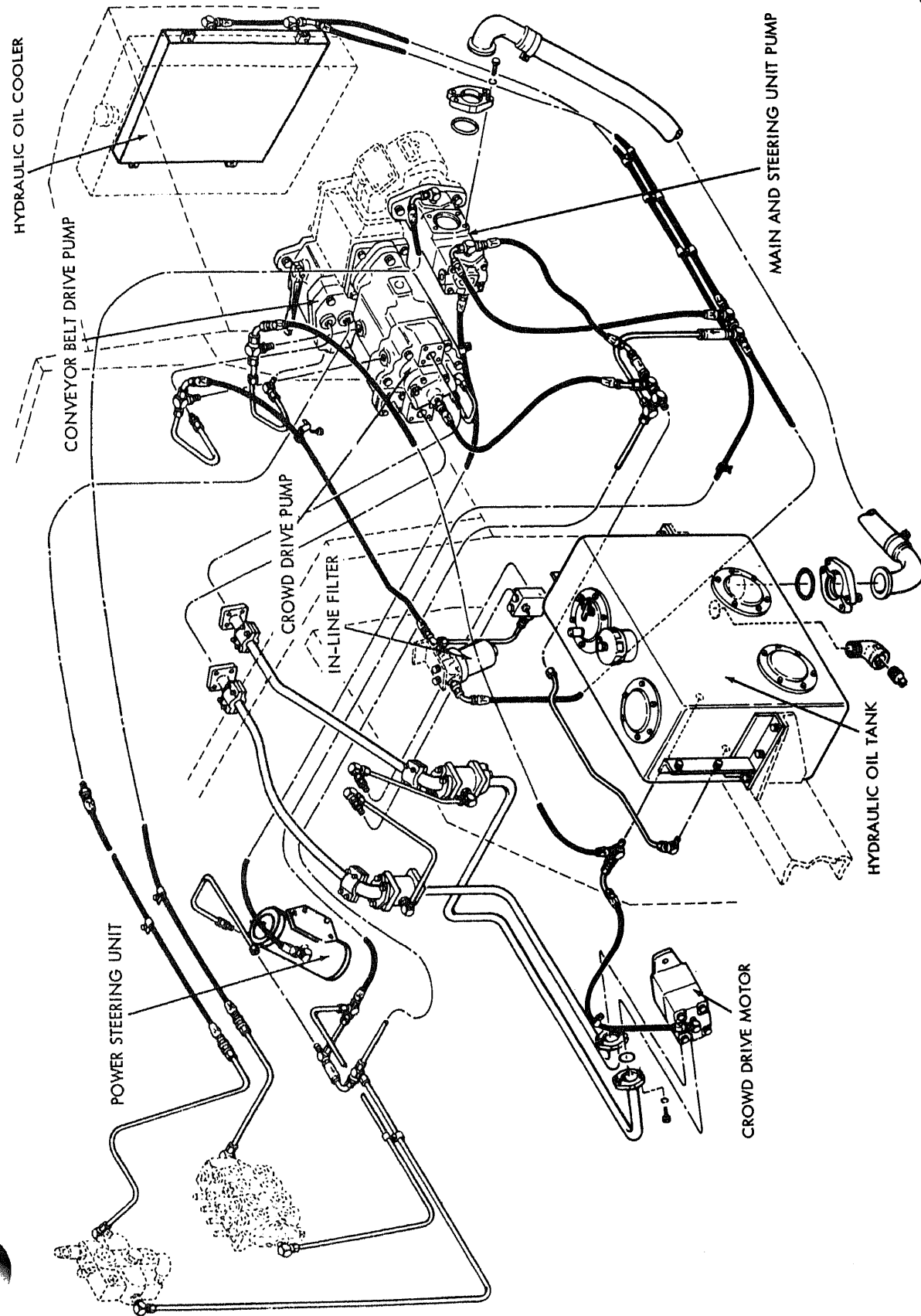
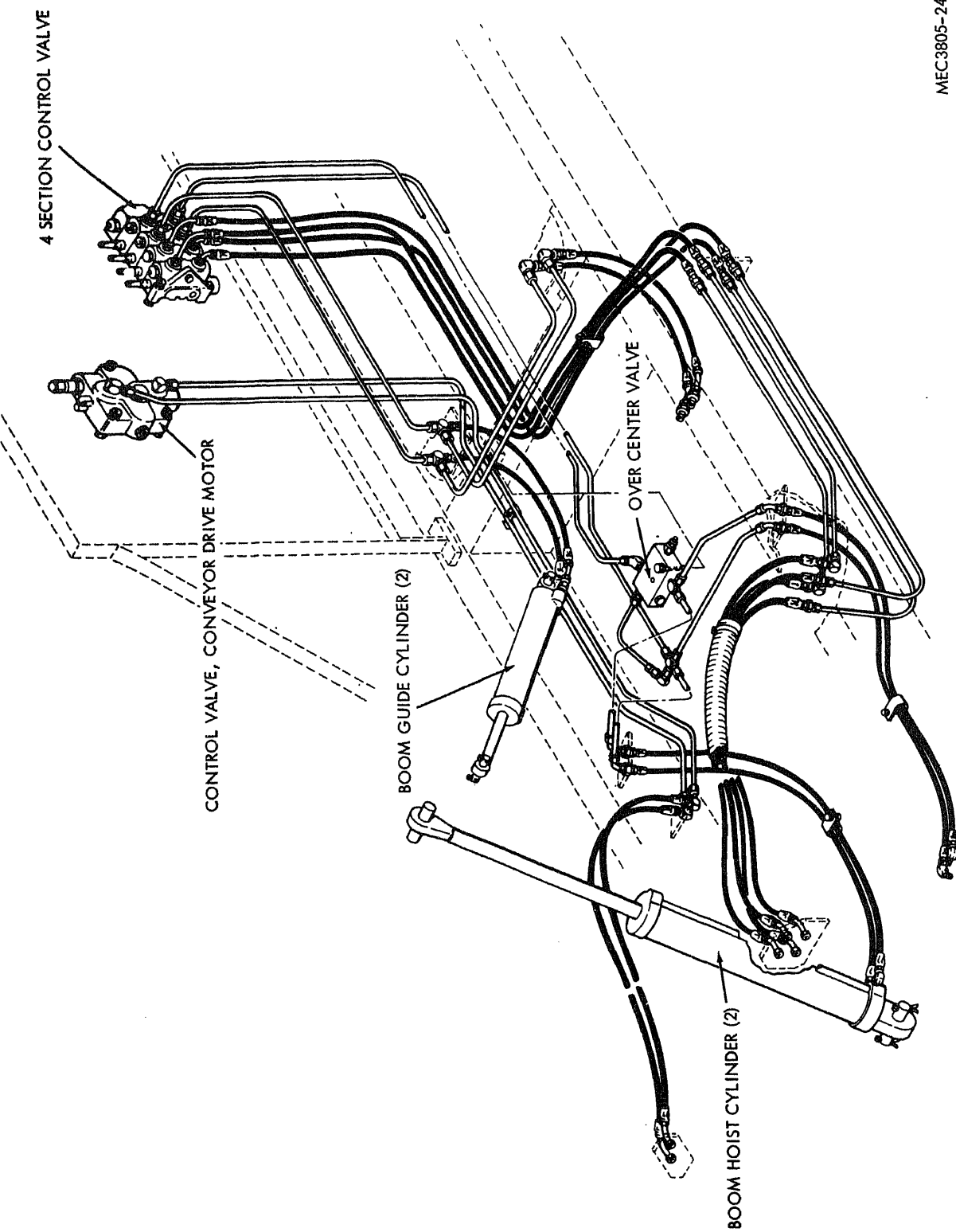


Figure 9-61(1). Hydraulic system diagram.



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Figure 3-64 (2)—Continued.

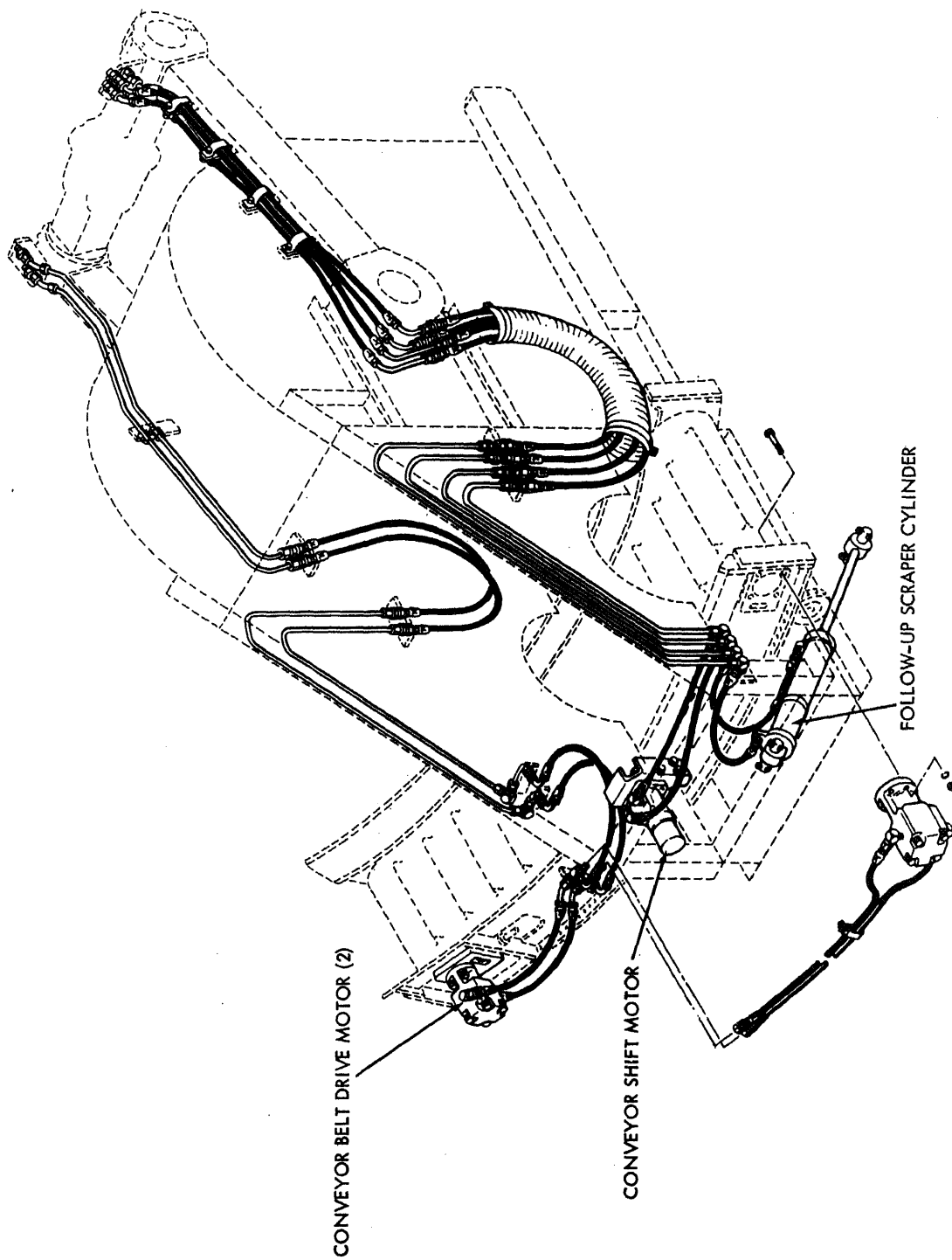


Figure 3-64(3)—Continued.

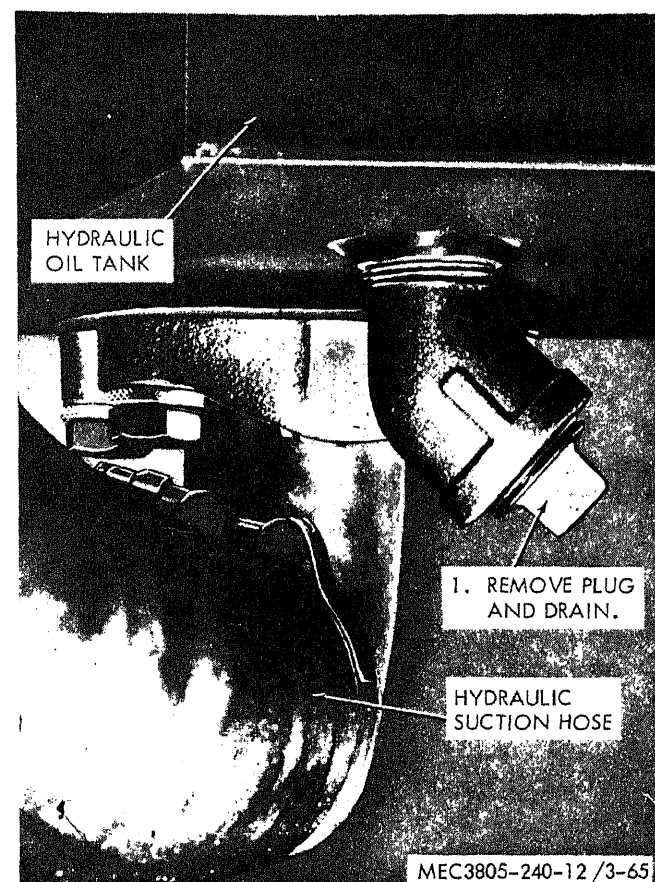


Figure 3-65. Hydraulic oil tank—drain.

c. *Relief Valve.* Refer to figure 3-68 and service valve.

(2) *Removal.* Refer to figure 3-69 and remove valve assembly.

(3) *Installation.* Refer to figure 3-69 and install valve assembly.

3-56. Hydraulic In-Line Filter

a. *Service.* Refer to figure 3-70 and replace filter element.

b. *Removal.* Refer to figure 3-71 and remove filter assembly.

c. *Installation.* Refer to figure 3-71 and install filter assembly.

3-57. Manual Control Linkages

a. *Inspection.*

(1) Inspect all control linkages for free operation.

(2) Inspect all control linkages for missing or damaged cotterpins, bent control arms, broken welds on hangers and control handles. Replace damaged parts.

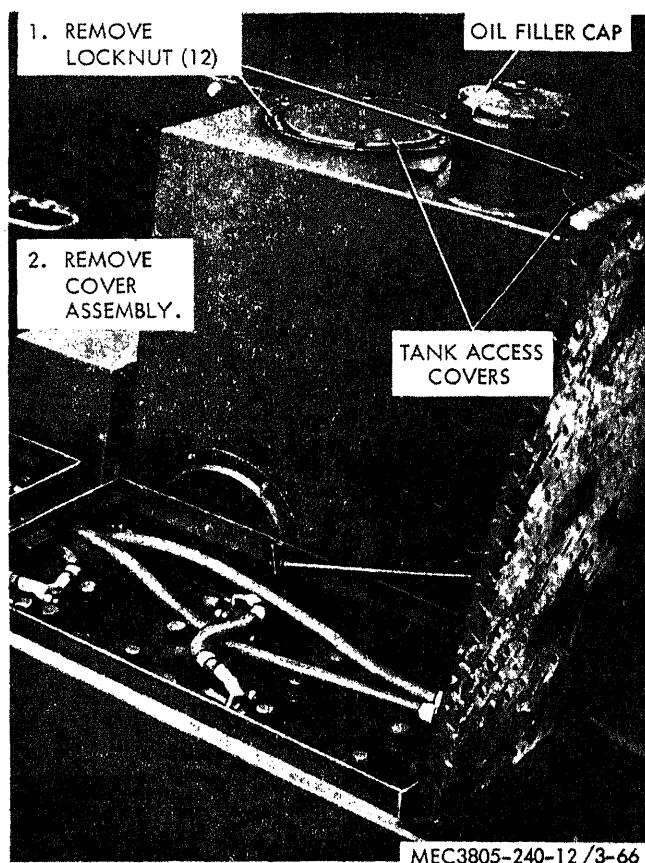


Figure 3-66. Hydraulic tank access cover, removal and installation.

(3) Tighten all jamnuts, bellcrank hanger fastenings, ball joint nuts, and control handle fastenings to panels.

b. *Lubrication.* Lubricate in accordance with current lubrication order.

3-58. Cylinders

a. Inspect cylinders for leaks, free travel, and damage.

b. Inspect hoses and fittings for leaks, damage, or deterioration. Replace defective hoses. Report damaged cylinders to direct support maintenance.

Caution: Bleed air from system after replacing hoses (para 2-3).

3-59. Conveyor Drive Pump

a. *Inspection.* Inspect pump for leaks, damage, and proper adjustment. Report damage to direct support maintenance.

b. *Adjustment.* Refer to figure 3-72 and adjust the conveyor drive pump.

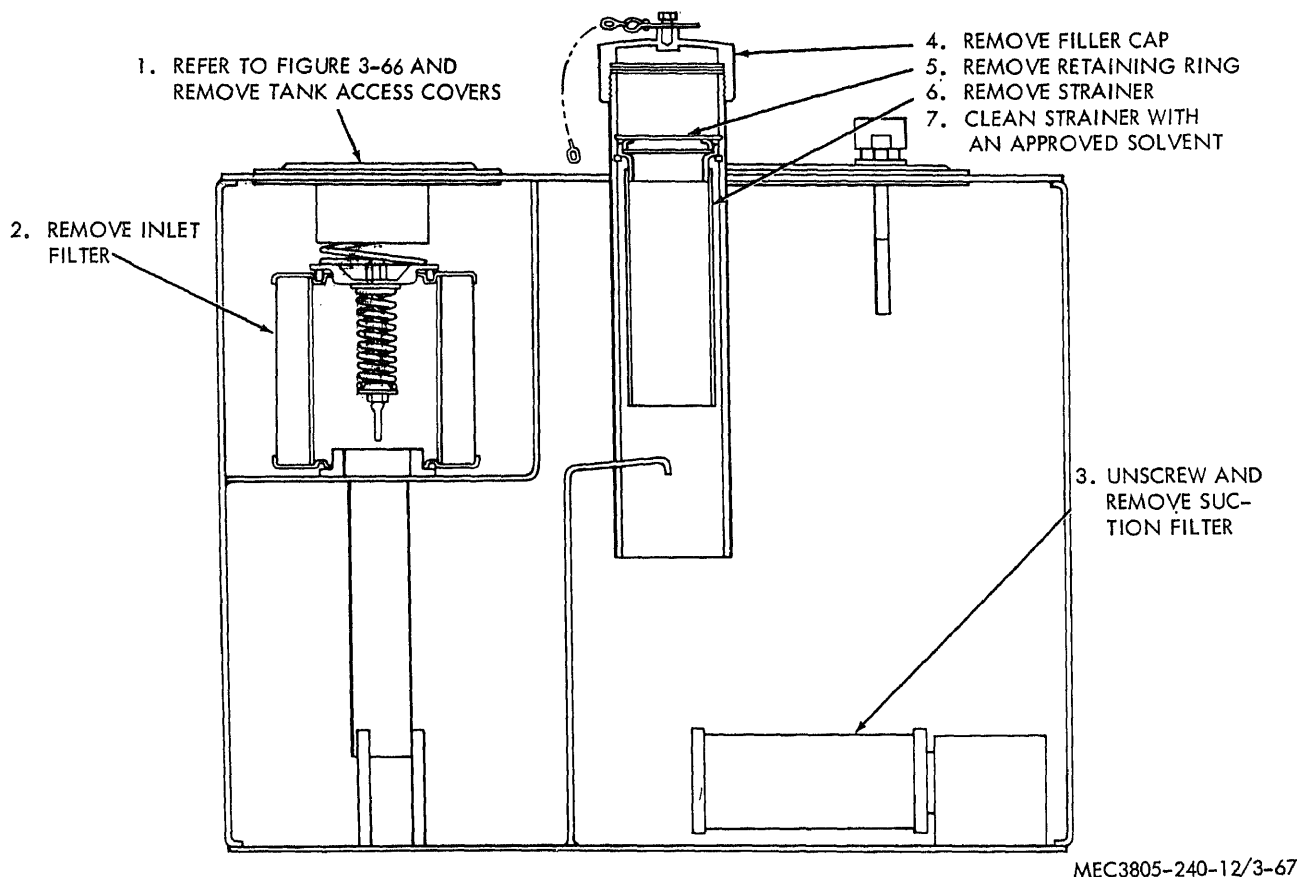


Figure 3-67. Hydraulic oil tank filters, removal and installation.

3-60. Oil Cooler

a. Inspection. Inspect cooler core for leaks and damage. Report damaged core to direct support maintenance.

b. Service. Refer to figure 3-73 and service cooler.

3-61. Tubing and Fittings

a. Inspection.

(1) Inspect tubing for leaks, restrictions, cracks and breaks.

(2) Inspect fitting nuts for rounded hex points, cracks or other damage.

b. Assembly. Refer to figure 3-74 and assemble tubing and fittings.

Caution: Bleed air from system after replacing tubing (para 2-3).

3-62. Hose and Fittings

a. Inspection.

(1) Inspect for leaks and restrictions, and for cracked, frayed or broken hose.

(2) Inspect fittings for rounded hex points, cracks or other damage.

b. Assembly. Refer to figure 3-75 and assemble hoses and fittings.

Caution: Bleed air from system after replacing hoses (para 2-3).

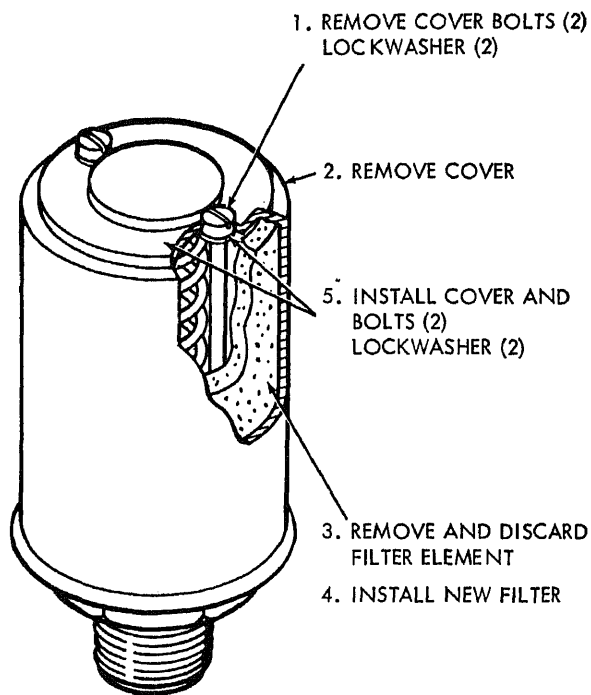
3-63. Power Steering Unit

a. General. The power steering unit is mounted on the machine frame directly in front of the left-hand center fender. Hydraulic pressure assists in moving the pitman arm on the unit to reduce steering effort.

b. Inspection.

(1) Inspect hydraulic hose and tubing for leaks, tight fittings, and damage.

(2) Inspect steering unit for damage. Tighten loose mounting bolts. Report damage to direct support maintenance.



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Figure 3-68. Hydraulic tank relief valve service.

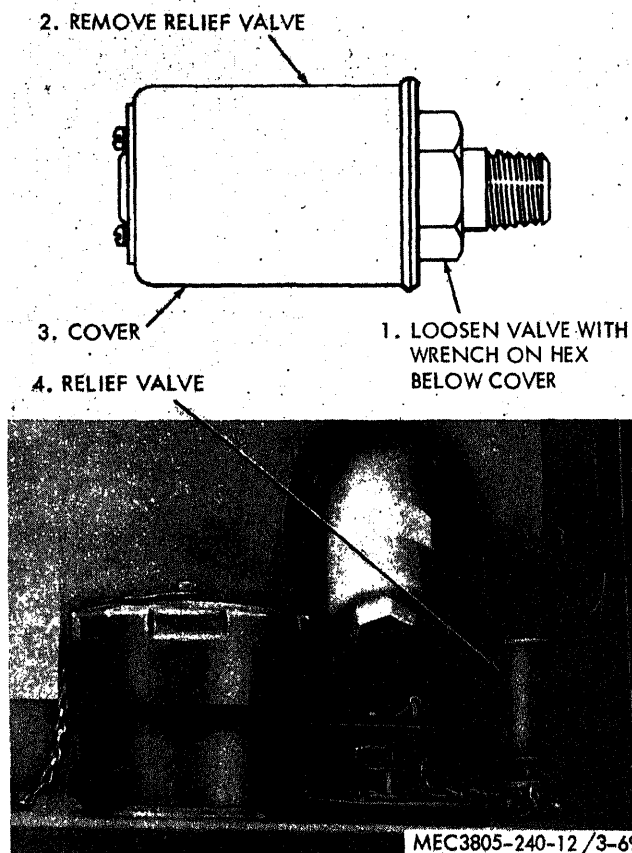


Figure 3-69. Hydraulic tank relief valve, removal and installation.

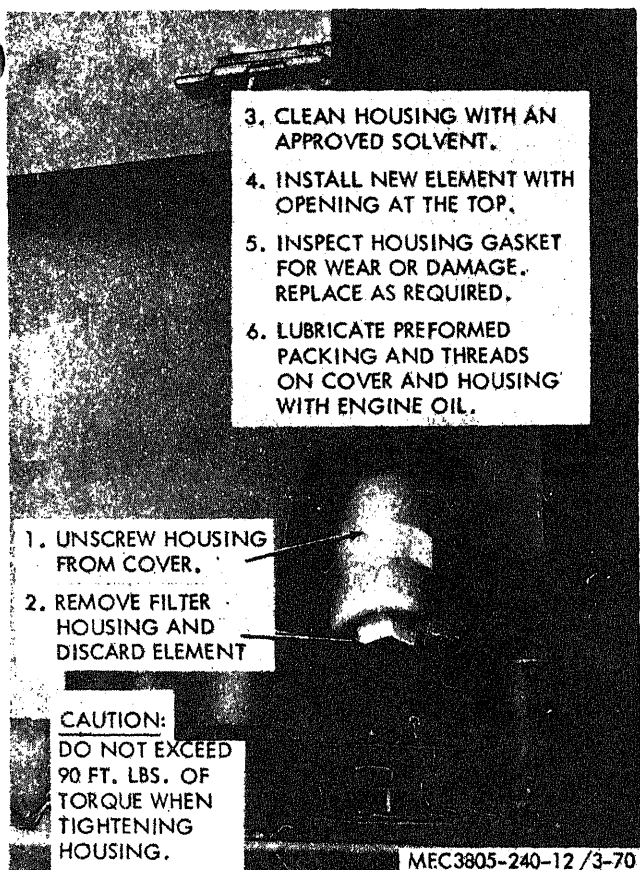
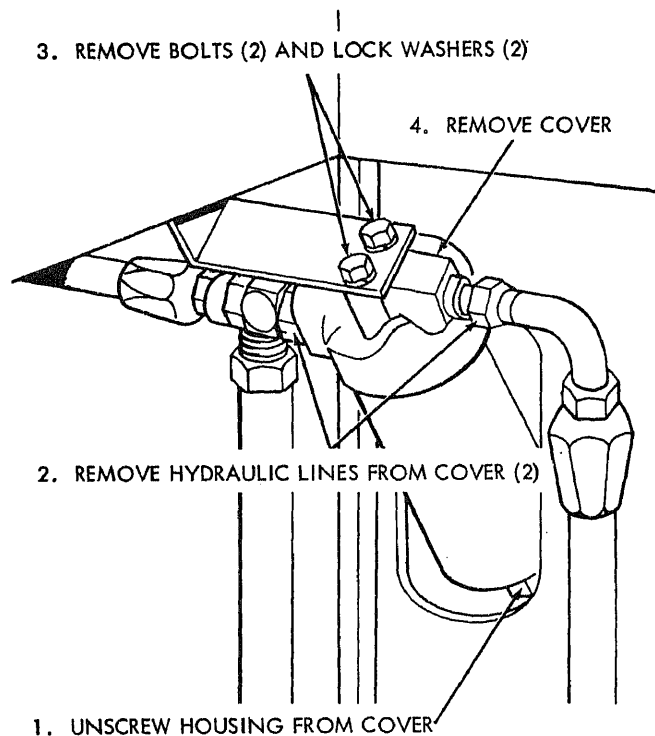


Figure 3-70. Hydraulic in-line filter service.



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Figure 3-71. Hydraulic in-line filter, removal and installation.

1. MOVE MANUAL CONTROL TO HIGH SPEED POSITION.

3. TO ADJUST: REMOVE BALL JOINT FROM LEVER.

5. IF NOT, LOOSEN CLAMP ON PINTLE SHAFT.

6. REMOVE LEVER.

8. TIGHTEN CLAMP ON PINTLE SHAFT.

9. INSTALL BALL JOINT AND TIGHTEN.

4. MOVE LEVER BY HAND TO DETERMINE IF IT IS AGAINST STOP.

7. INSTALL LEVER ON PINTLE SHAFT IN POSITION TO MATCH COUPLING WITH BALL JOINT.

2. CHECK LEVER FOR THIS POSITION AGAINST STOP INSIDE PUMP.



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Figure 3-72. Conveyor drive pump lever adjustment.

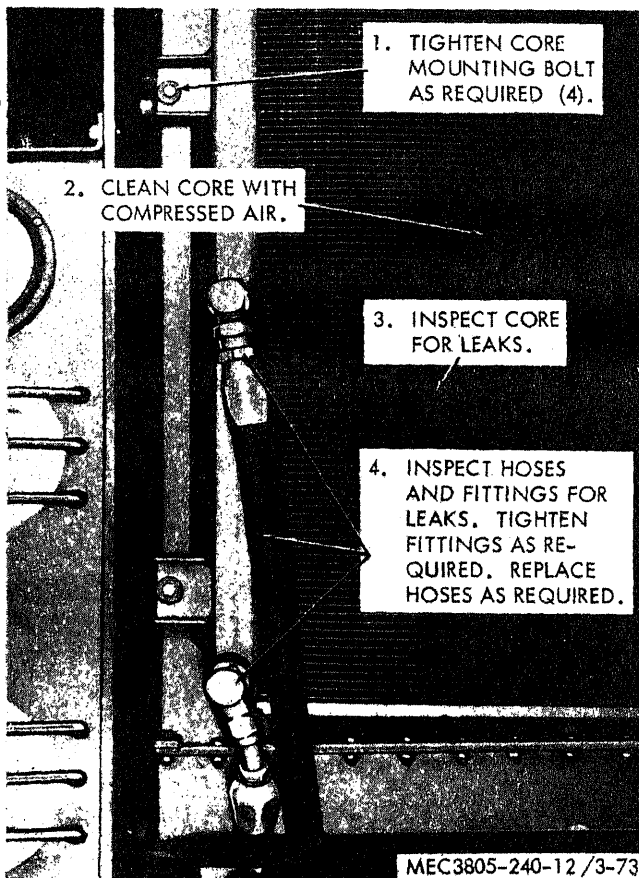
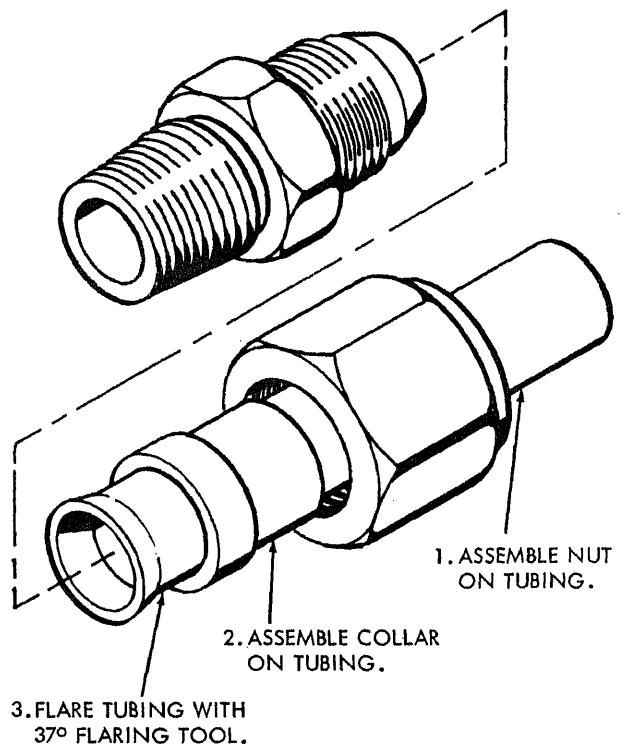


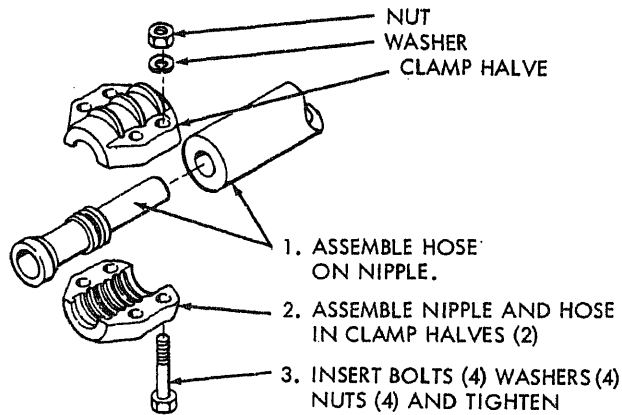
Figure 3-73. Hydraulic oil cooler service.



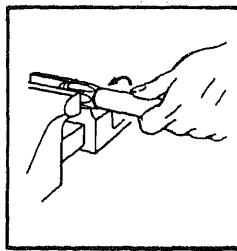
MEC3805-240-12 /3-74

Figure 3-74. Renewable tube fittings, removal and installation.

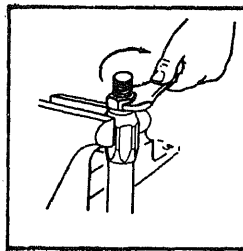
A. REUSABLE SPLIT FLANGE
FITTING (MEDIUM PRESSURE)



B. REUSABLE SCREW-TYPE
FITTING (MEDIUM PRESSURE)

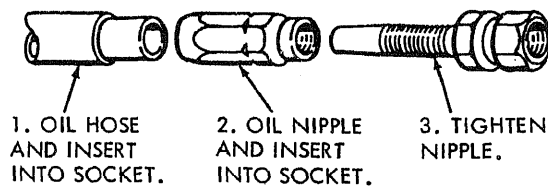


1. INSERT HOSE IN
SOCKET BY TURNING
HOSE COUNTER-
CLOCKWISE.



2. OIL NIPPLE AND
TIGHTEN INTO
SOCKET.

C. REUSABLE SCREW TYPE
FITTING (HIGH PRESSURE)



NOTE: THE SOCKET HAS A MARK WHICH MUST BE TRANSFERRED TO THE HOSE FOR INDICATING SKIVING LENGTH. TRANSFER THE MARK TO THE HOSE END AND CUT THE HOSE COVERING RUBBER DOWN TO THE METAL REINFORCING MESH UP TO THE MEASURE MARK.

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Figure 3-75. Renewable hose fittings, removal and installation.

Section X. AIR AND BRAKE SYSTEM

3-64. General

The air and brake systems are supplied with air by a compressor located on the left side of the engine block. The air compressor is a single-acting, two cylinder, reciprocating type with a rated capacity of 12 cfm at 1,250 rpm. The air compressor runs whenever the engine runs, but actual compression of air is controlled by a governor. The governor causes air compression to start when the system air pressure falls below 80-85 psi and stop when air pressure exceeds 100-115 psi. Air reservoirs accumulate the compressed air. Each air reservoir has a safety valve which safeguards the air system from pressures above 150 psi. A buzzer and a low air pressure indicator give automatic warning when the air pressure drops below the required minimum of 60 psi. An alcohol evaporator feeds vaporized alcohol into the intake air of the air compressor to prevent freezing in the air system when operating at below freezing temperatures.

3-65. Air Compressor

a. Inspection.

(1) Refer to figure 3-9 and inspect the compressor drive belt tension and alinement. Inspect belt for wear or damage. Replace a defective belt.

(2) Inspect air intake and exhaust gaskets and fittings for leaks and damage. Replace defective parts.

(3) Inspect water inlet and outlet hoses for leaks and damage.

(4) Inspect oil inlet and outlet hoses for leaks and damage.

(5) Inspect alcohol evaporator hoses and fittings for leaks and damage. Remove filler cap and observe if air bubbles are coming up through the alcohol, while engine is running. If evaporator is faulty, report to direct support maintenance.

b. Service.

(1) Refill alcohol evaporator as required.

(2) Tighten compressor mounting bolts

(4).

Caution: When draining engine block to prevent freezing, the compressor must also be drained. Remove pipe plugs (2) from the head and block and drain. Replace the plugs after draining.

c. Cooling Water Hoses.

(1) *Removal.* Refer to figure 3-77 and remove hoses.

(2) *Installation.* Refer to figure 3-77 and install hoses.

d. Drive Belt.

(1) *Removal.* Refer to figure 3-78 and remove belt.

(2) *Installation.* Refer to figure 3-78 and install belt.

e. Governor Adjustment. Refer to figure 3-79 and adjust governor.

f. Lubricating Oil Hose.

(1) *Removal.* Refer to figure 3-80 and remove hose.

(2) *Installation.* Refer to figure 3-80 and install hose.

3-66. Air Reservoir

a. Draining. Push drain valve control on dash to actuate reservoir drains (3). Drain as required until all moisture and sediment has been removed.

b. Cleaning. Wash off mud and dirt with water.

c. Inspection. Inspect air reservoir (2) for leaks, tight fittings, and damage.

3-67. Air Reservoir Safety Valves

a. Inspection.

(1) Inspect valves (2) for leaks, tightness and damage.

(2) Pull exposed end of pin to check release of valve. If valve does not release, report to direct support maintenance.

b. Adjustment. Refer to figure 3-81 and adjust valve.

3-68. Brake Treadle Valve

a. Inspection.

(1) Refer to figure 3-134 and remove left front panel.

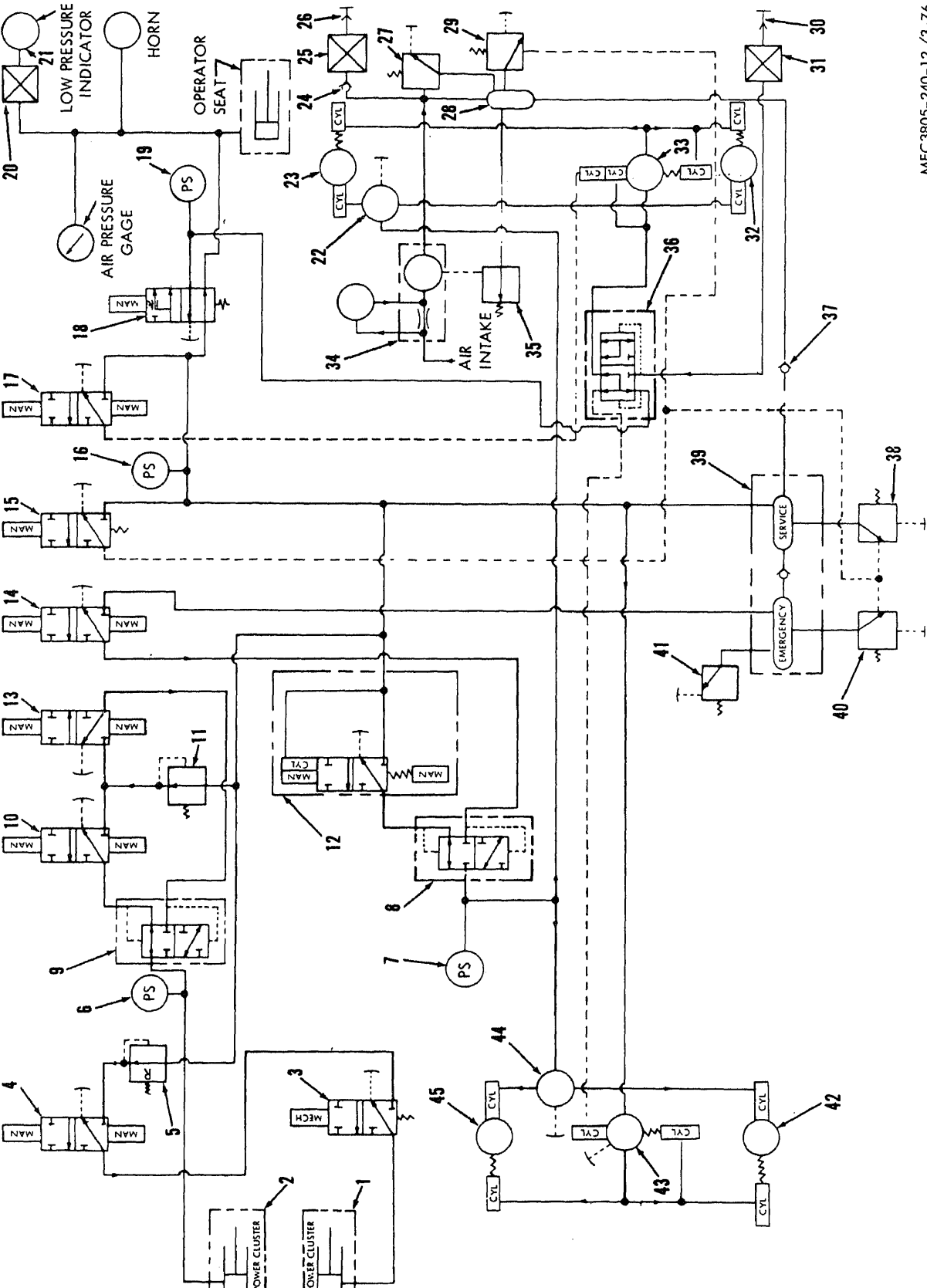
(2) Inspect valve and fittings for leaks with a soap solution or equivalent. Check fittings and hoses for tightness and leaks. If leakage is excessive, report to direct support maintenance.

(3) Refer to figure 3-134 and install left front panel.

b. Adjustment.

(1) The clearance between treadle roller and button on top of valve should be 1/16 inch.

(2) Adjust by turning the adjusting screw under the heel of the treadle. Tighten locknut after adjusting.



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- 3 Pilot air valve
- 4 Bucket line control push-pull air valve
- 5 Bucket line power cluster assembly
- 6 Differential lock-up pressure switch

Figure 3-76. Air system diagram.

| | | | | | |
|----|---|----|---|----|----------------------------------|
| 7 | Emergency brake pressure switch | 20 | Indicator shut-off valve | 34 | Compressor assembly |
| 8 | Emergency brake double check valve | 21 | Low air pressure indicator | 35 | Air system governor |
| 9 | Differential lock-up double check valve | 22 | Front quick release valve | 36 | Service brake double check valve |
| 10 | Differential lock-up toggle type control valve | 23 | Front brake chamber | 37 | Single check valve |
| 11 | Differential lock-up fluid pressure regulating valve assembly | 24 | Single check valve | 38 | Drain valve |
| 12 | Emergency brake push-pull air valve | 25 | Hose coupling shut-off cock | 39 | Two-compartment air reservoir |
| 13 | Differential lock-up toggle type control valve | 26 | Automatic towing hose coupling assembly | 40 | Drain valve |
| 14 | Emergency brake toggle type control valve | 27 | Safety valve | 41 | Safety valve |
| 15 | Drain control push valve | 28 | Single compartment air reservoir | 42 | Rear brake chamber |
| 16 | Low pressure switch | 29 | Drain valve | 43 | Relay valve |
| 17 | Front brake limiter toggle type control valve | 30 | Automatic towing hose coupling assembly | 44 | Rear quick release valve |
| 18 | Brake valve | 31 | Hose coupling shut-off cock | 45 | Rear brake chamber |
| 19 | Stop light pressure switch | 32 | Front brake chamber | | |
| | | 33 | Limiting and quick release valve | | |

Figure 3-76—Continued.

2. UNSCREW MALE FITTING (2).

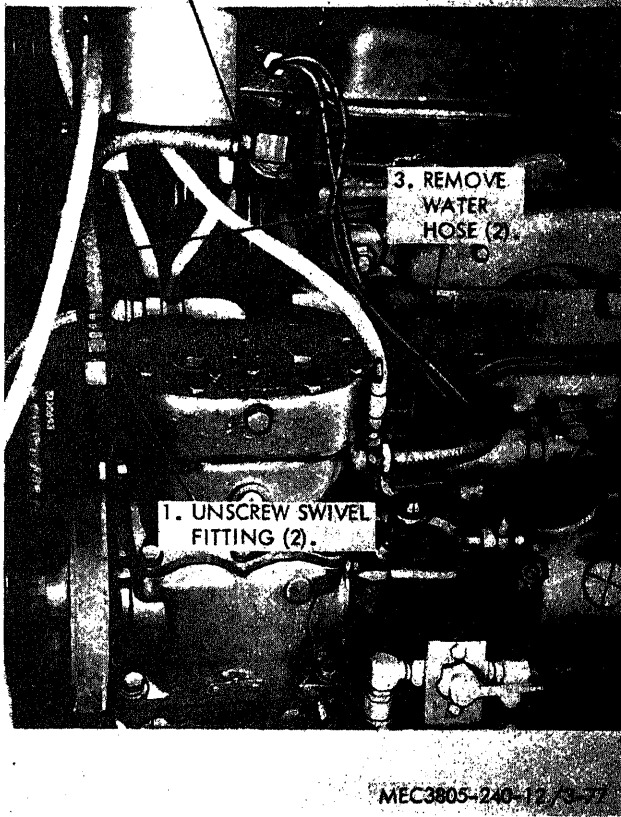


Figure 3-77. Air compressor water hoses, removal and installation.

3-69. Power Clusters

a. General. Two power clusters operate clutches in the transfer case serving the differential lock-up and bucket line drive. Air chambers operate hydraulic pistons which actuate the clutches. Access holes to the power cluster reservoirs are located in the cab floor to the left of the driver's seat.

b. Inspection.

(1) Refer to figure 3-129 and remove left center fender.

(2) Inspect mounting bolts (13) and fittings for tightness. Inspect tubing and fittings for leaks with a soap solution or equivalent.

(3) Inspect power clusters for damage and leaking fluid.

(4) Report defective power clusters to direct support maintenance.

c. Service.

(1) Blow dust and dirt from around the reservoir fill plug before removal.

(2) Remove fill plug and inspect for damaged threads and gasket.

(3) Clean breather holes in plug with a small nail or piece of wire and wash plug with an approved solvent. Dry thoroughly with compressed air.

(4) Refer to current lubrication order and fill reservoir. Replace fill plug.

3-70. Air Brake Slack Adjusters

a. Inspection.

(1) Inspect adjusters (4) for damage.

(2) Inspect locking sleeves for free operation.

b. Adjustment. Refer to figure 3-82 and adjust slack adjuster.

3-71. Chamber Assembly

a. Inspection.

(1) Inspect chambers for damage, tight fittings, and hoses.

(2) Inspect pushrods (4) and yokes for damage and alignment.

b. Manual Brake Release. Refer to figure 3-83 and release brakes.

3-72. Low Air Pressure Indicator Assembly

a. Inspection. Inspect for leaks and damage.

b. Removal. Refer to figure 3-84 and remove low air pressure indicator assembly.

c. Installation. Refer to figure 3-84 and install low air pressure indicator assembly.

d. Adjustment. Refer to figure 3-85 and adjust low air pressure indicator assembly.

3-73. Parking Brake Control Assembly

a. Inspection. Inspect for leaks, damage, tight fittings and free operation.

b. Removal. Refer to figure 3-86 and remove parking brake control assembly.

c. Installation. Refer to figure 3-86 and install parking brake control assembly.

3-74. Towing

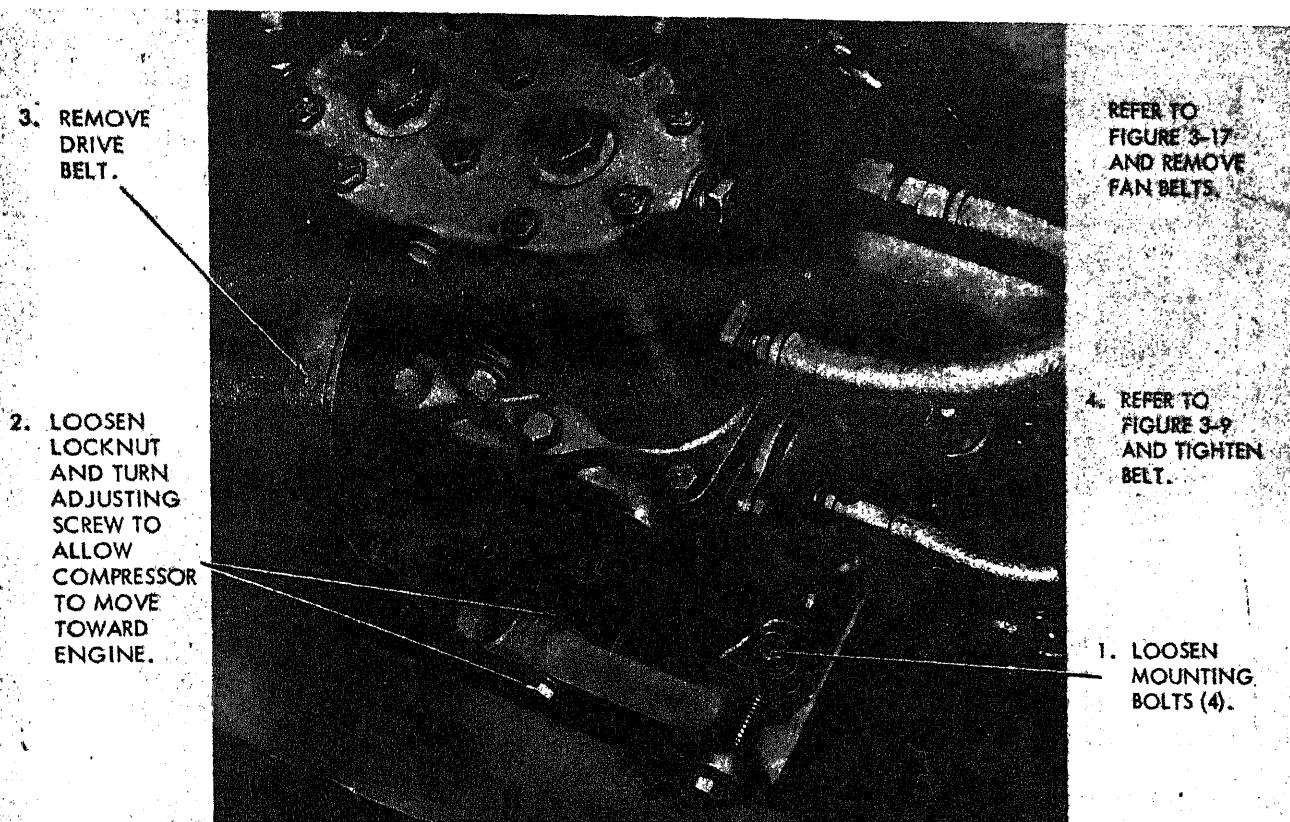
Refer to figure 3-87 for towing instructions.

3-75. Emergency and Service Air Couplings

a. Inspection. Inspect couplings (2) for leaks, tight fittings and damage.

b. Removal. Refer to figure 3-88 and remove air couplings.

c. Installation. Refer to figure 3-88 and install air couplings.



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Figure 3-78. Air compressor drive belt, removal and installation.

3-76. Driver's Seat Control Valve and Cylinder

a. General. The driver's seat is equipped with an air cylinder which can be regulated for a soft or a firm ride. The control valve is located on the left-hand side of the seat assembly.

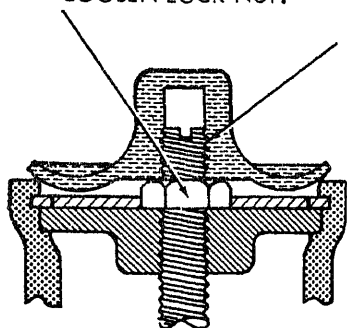
b. Inspection.

(1) Inspect the valve and cylinder for leaks or damage. Tighten any loose fittings. Report defects to direct support maintenance.

(2) Inspect hoses for leaks, damage or deterioration. Replace hoses as required.

1. CHECK AIR TANK AT FULL PRESSURE. THE GOVERNOR SHOULD REGULATE PRESSURE BETWEEN 100-115 PSI. IF PRESSURE IS TOO HIGH OR TOO LOW, ADJUSTMENT IS REQUIRED.

2. REMOVE COVER AND LOOSEN LOCK NUT.

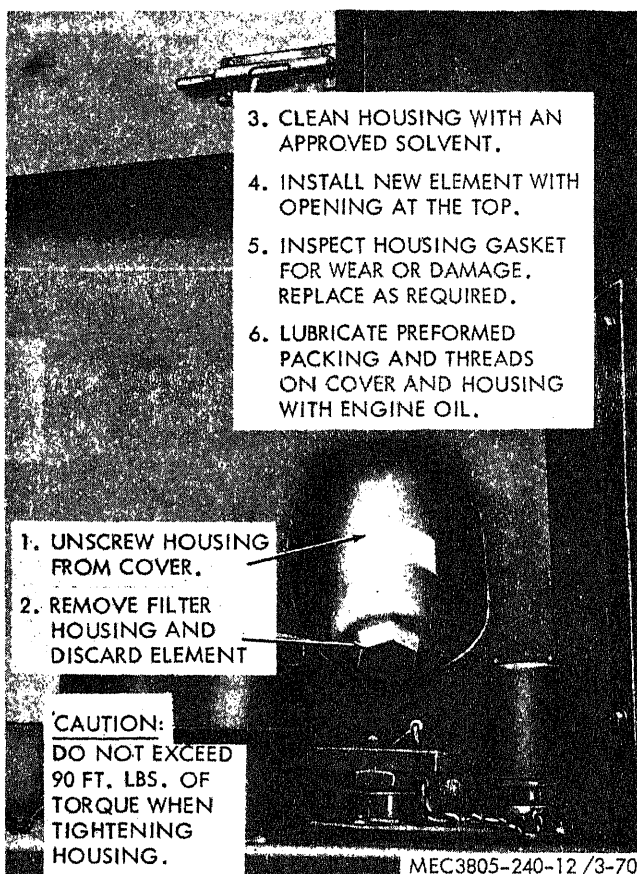


3. TURN THE ADJUSTING SCREW COUNTER-CLOCKWISE TO INCREASE PRESSURE. TURN THE ADJUSTING SCREW CLOCK-WISE TO DECREASE PRESSURE.

4. TIGHTEN LOCK NUT, RE-INSTALL GOVERNOR COVER.

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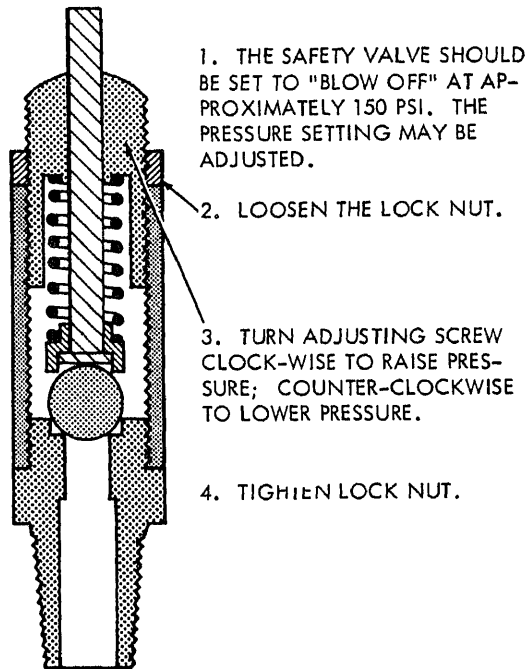
Figure 3-79. Governor adjustment.



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Figure 3-80. Air compressor oil hose.

NOTE: ONE SAFETY VALVE ON SERVICE AIR RESERVOIR, ONE SAFETY VALVE ON EMERGENCY AIR RESERVOIR.



MEC3805-240-12 /3-81

Figure 3-81. Air reservoir safety valve adjustment.

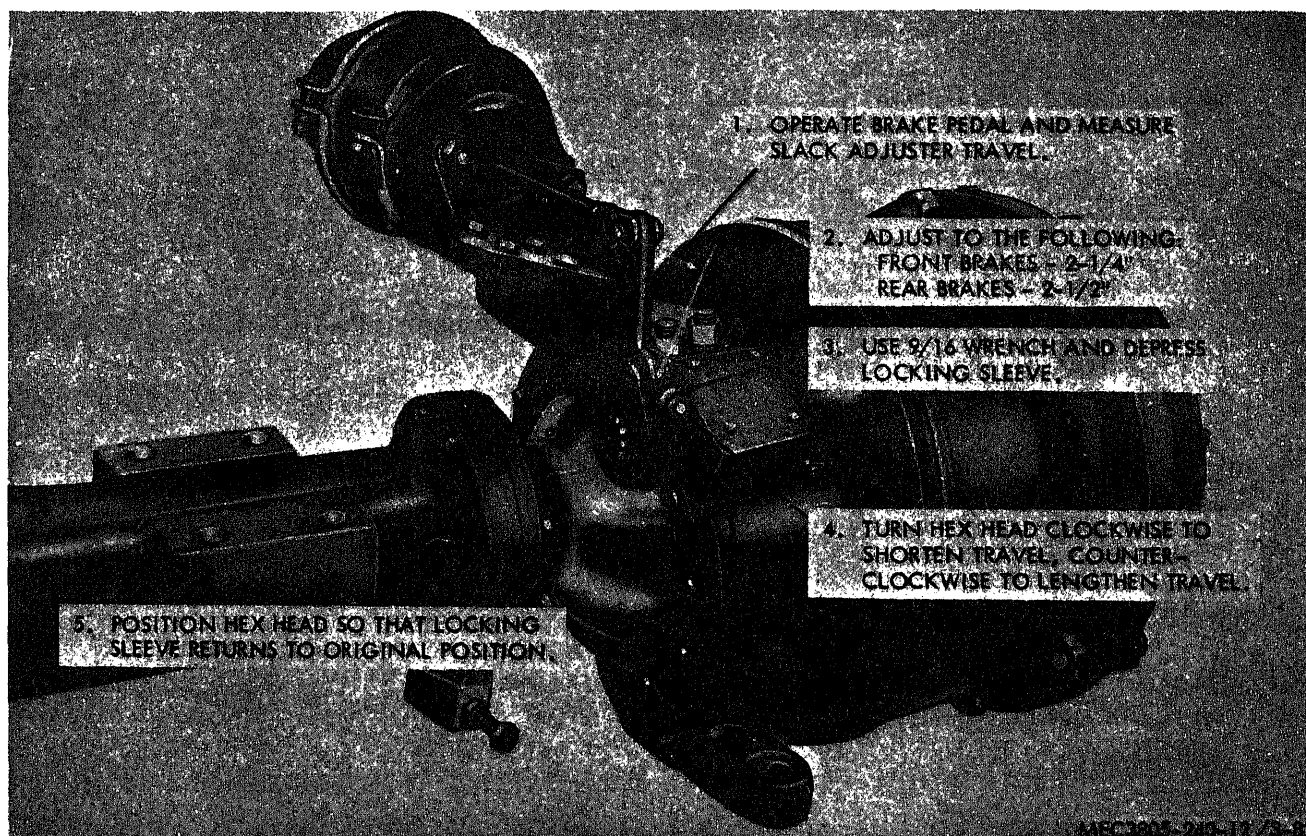


Figure 3-82. Slack adjuster adjustment.

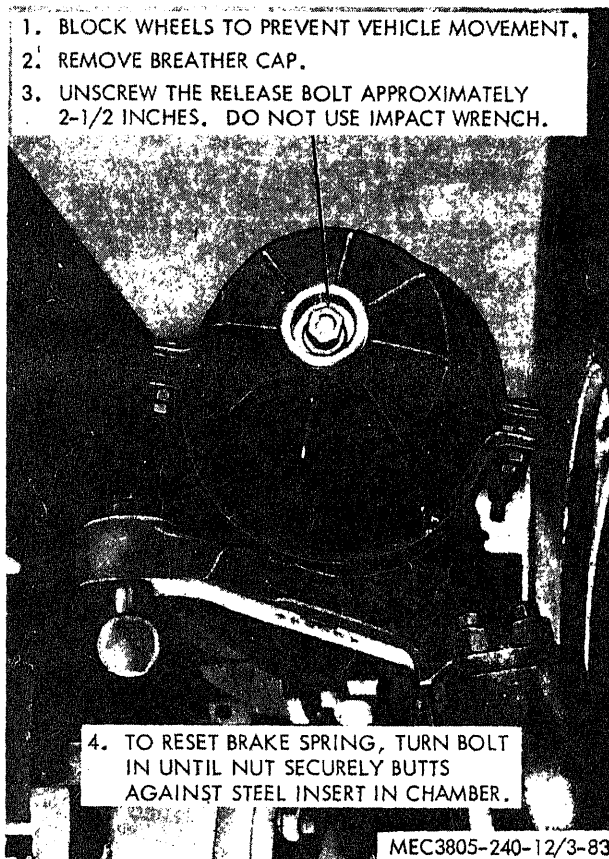


Figure 3-83. Brake spring, manual release.

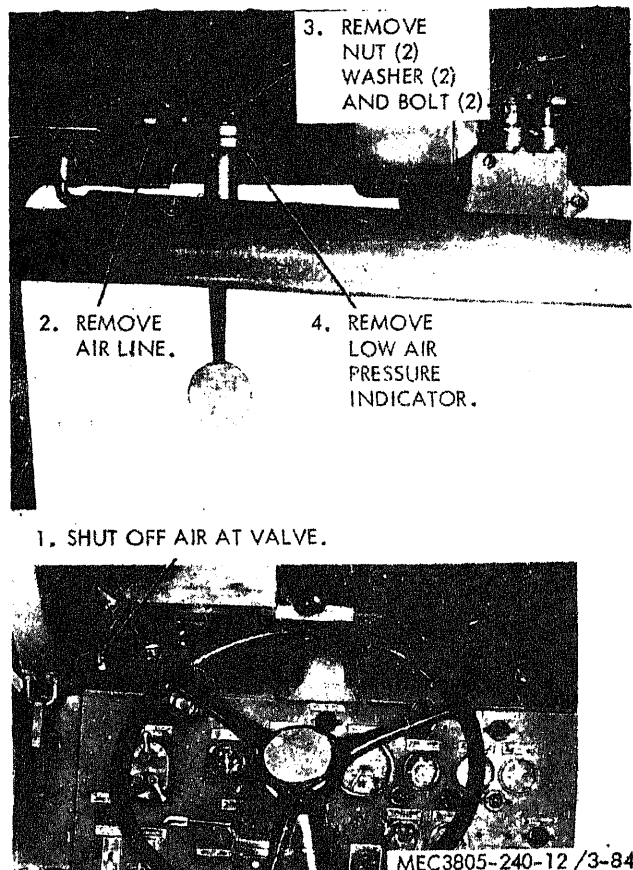
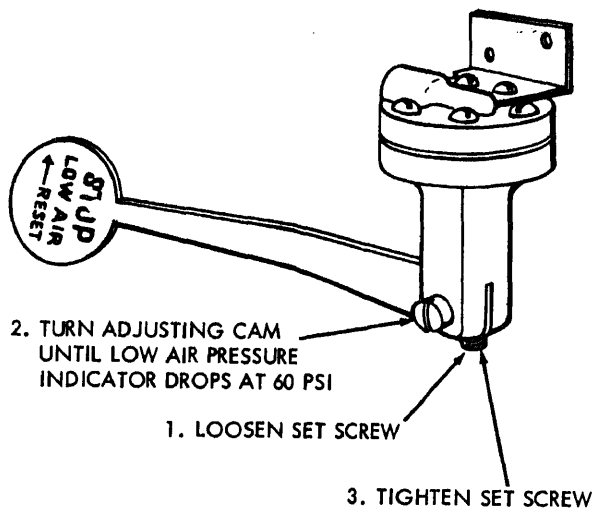
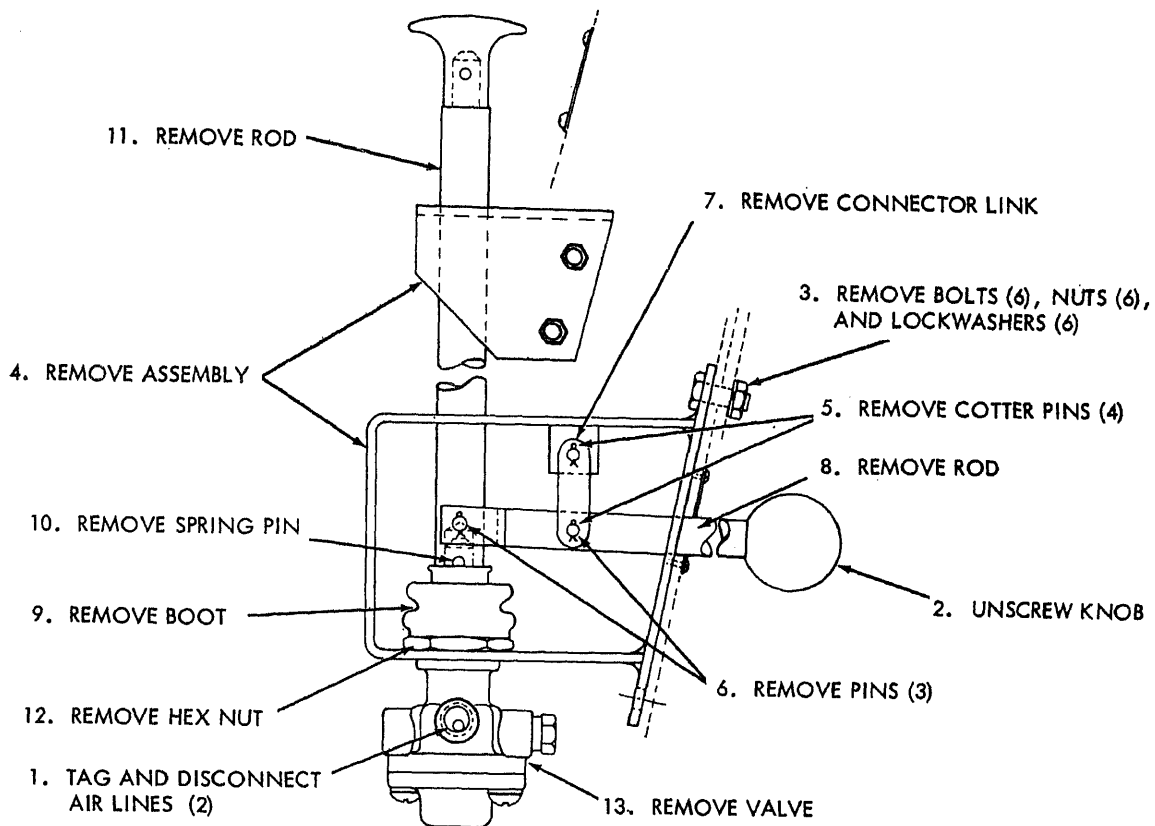


Figure 3-84. Low air pressure indicator, removal and installation.



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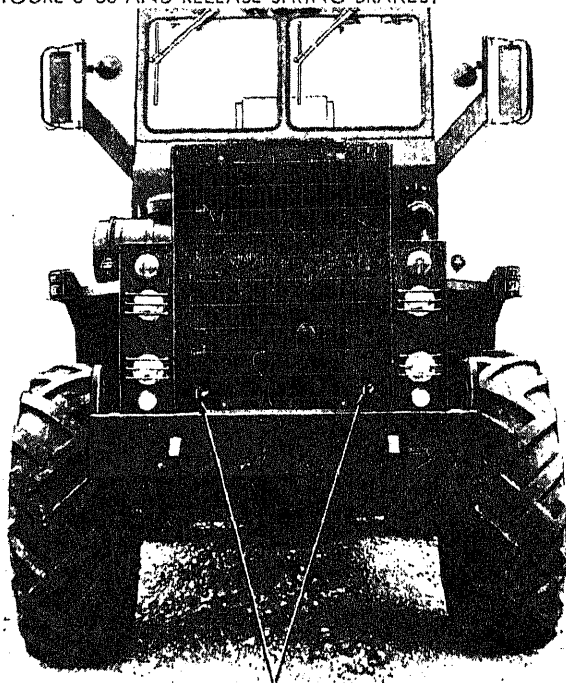
Figure 3-85. Low air pressure indicator adjustment.



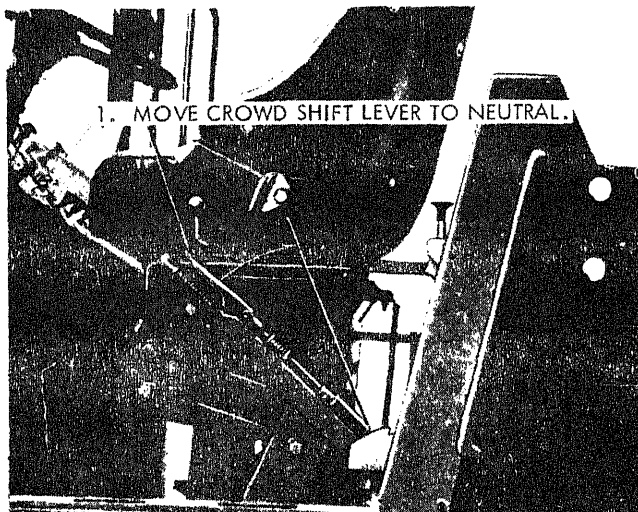
MEC3805-240-12 /3-86

Figure 3-86. Parking brake control assembly, removal and installation.

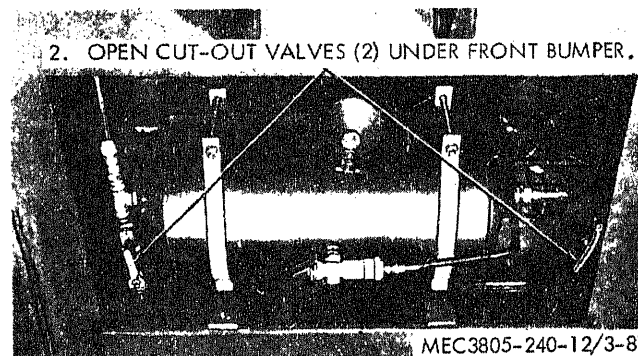
NOTE: IF AIR SYSTEM ON DITCHER FAILS, EMERGENCY BRAKE VALVE ON DASH WILL RELEASE SPRING BRAKES 3 TO 4 TIMES. IF EMERGENCY SYSTEM FAILS, REFER TO FIGURE 3-83 AND RELEASE SPRING BRAKES.



3. CONNECT AIR LINES FROM TOWING VEHICLE TO EMERGENCY AND SERVICE AIR COUPLING (2) ON DITCHER.



1. MOVE CROWD SHIFT LEVER TO NEUTRAL.



2. OPEN CUT-OUT VALVES (2) UNDER FRONT BUMPER.

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Figure 3-87. Towing.

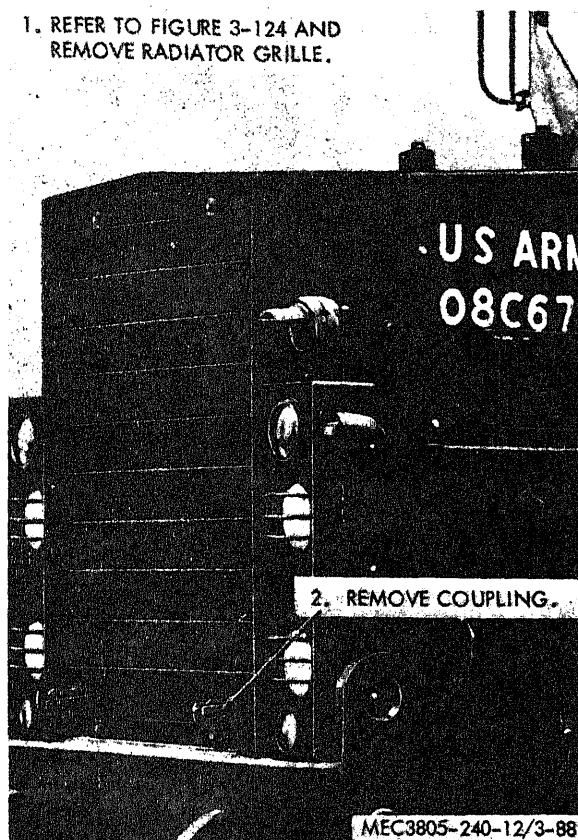


Figure 3-88. Emergency and service air couplings, removal and installation.

Section XI. DIGGING BOOM ASSEMBLY

3-77. General

The digging boom assembly consists of a boom guide, boom hoist, bucket line, spoil conveyor, and followup scraper. The boom assembly is protected from overloading damage by a clutch built into the transfer case.

Warning: Lower the bucket line to the ground before working on boom assembly.

3-78. Boom Hoist Assembly

a. General.

(1) The boom hoist assembly consists of a frame weldment, two cable sheaves, and a shaft assembly.

(2) Two hydraulic cylinders move the boom hoist to raise and lower the digging boom by means of the hoist cable assembly.

b. Inspection.

(1) Inspect boom hoist assembly for cracked

(2) Inspect cable sheaves for excessive wear and chipped flanges. Replace defective sheaves.

(3) Inspect the shaft and threaded parts for distortion or damage. Replace defective parts.

c. *Removal.* Refer to figure 3-89 and remove the boom hoist assembly.

d. *Installation.* Refer to figure 3-89 and install the boom hoist assembly.

3-79. Hoist Cable Assembly

a. *General.* Digging depth is controlled by moving the boom hoist assembly up and down. This motion is transferred to the digging boom by the hoist cable assembly. The cable runs through the digging boom over the boom hoist sheaves, and each end is attached to the ditcher frame.

b. Removal.

(1) Operate the diesel engine and lower the digging boom to the ground to remove the

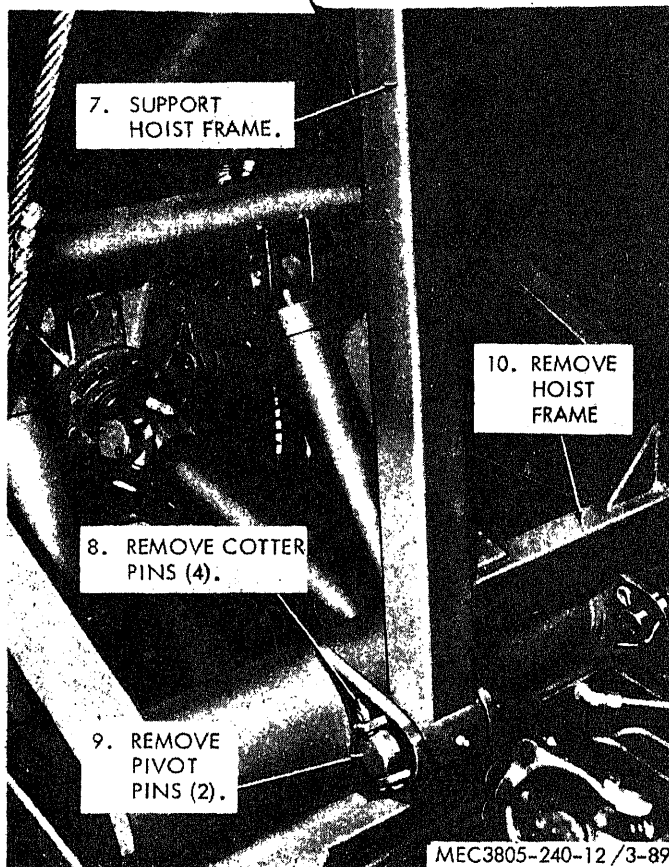
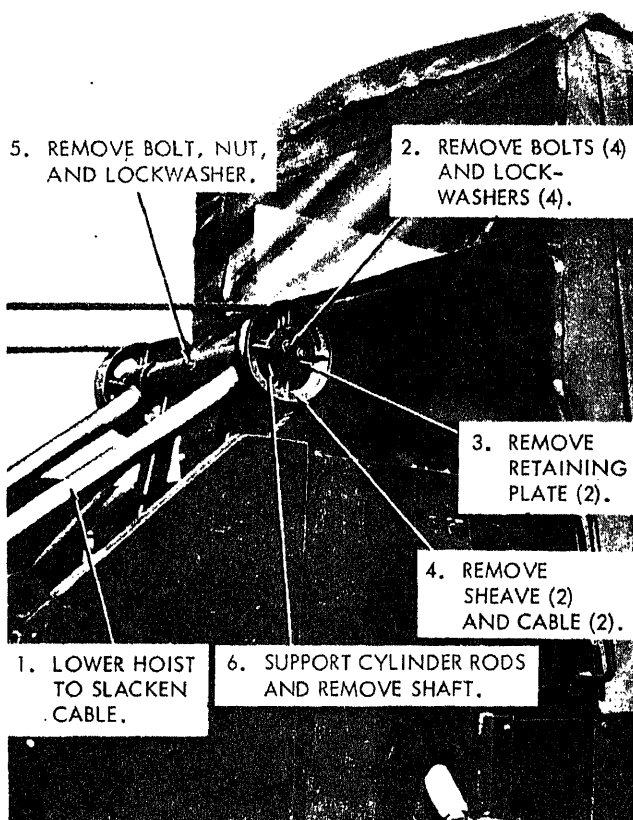


Figure 3-89. Boom hoist assembly, removal and installation.

(2) Refer to figure 3-90 and disconnect the

wedge socket assemblies from the machine frame.

(3) Drive the wedge out of the socket at one end of the cable assembly to free the cable end.

(4) Remove the cable from the hoist and boom assemblies.

(5) Remove the other wedge socket assembly.

c. *Cleaning.* Wash all parts in an approved solvent and dry with compressed air.

d. *Inspection and Repair.*

(1) Inspect the cable ends for frayed seizing or damage from wedge sockets. Reseize frayed ends with No. 22 gage wire as shown on figure 3-91.

(2) Inspect the cable, especially at wear points, for excessive wear, broken wire strands, or crushing. Replace a defective cable.

(3) Inspect wedges and sockets for burrs, sharp edges, or damage which could injure the cable ends. Repair or replace defective wedge socket assemblies.

e. *Installation.*

(1) Refer to figure 3-91 and install the cable.

(2) Lubricate the cable assembly in accordance with the current lubrication order.

3-80. Digging Boom Assembly

a. *General.*

(1) The digging boom assembly supports the bucket line assembly and houses the head shaft and boom-foot shaft sprocket assemblies.

(2) The digging boom assembly is attached to the boom guide assembly by the spreader arms and two guide rollers.

b. *Digging Boom.*

(1) *Cleaning.*

(a) Wash off mud and dirt with water.

(b) Remove grease and dirt accumulation with an approved solvent and dry with compressed air.

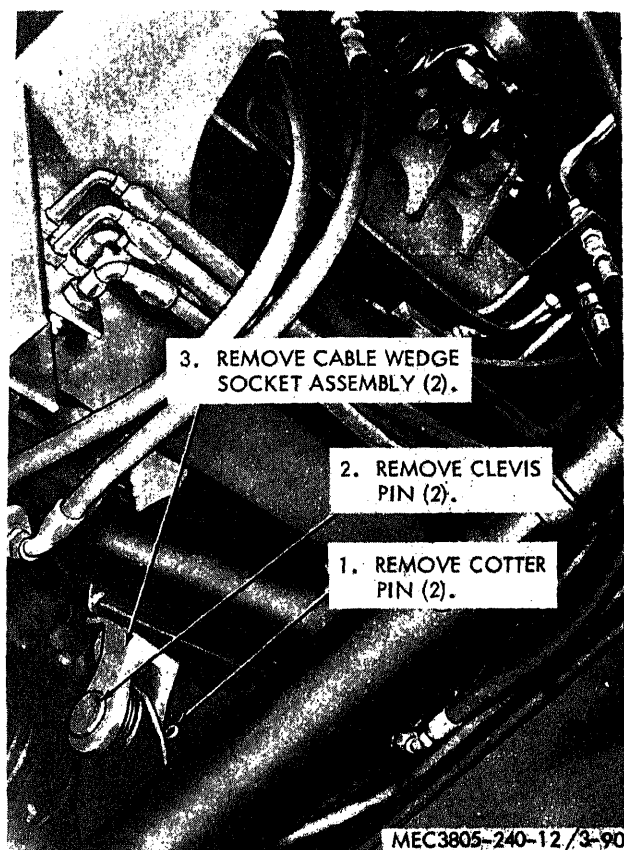


Figure 3-90. Cable wedge socket, removal and installation.

(2) *Inspection.*

(a) Inspect the boom weldment for cracked or broken welds, bent components, or other damage. Report defects to direct support maintenance. Repaint as required.

(b) Tighten loose mounting bolts and fittings. Replace threaded parts that are missing or damaged.

(c) Inspect the boom lock pins for wear, damage, and missing keeper pins. Straighten bent handles and smooth rough spots with emery cloth or a fine file. Replace badly worn or damaged lockpins.

(d) Inspect the boom guide rollers for wear, distortion, and binding. Report defects to direct support maintenance.

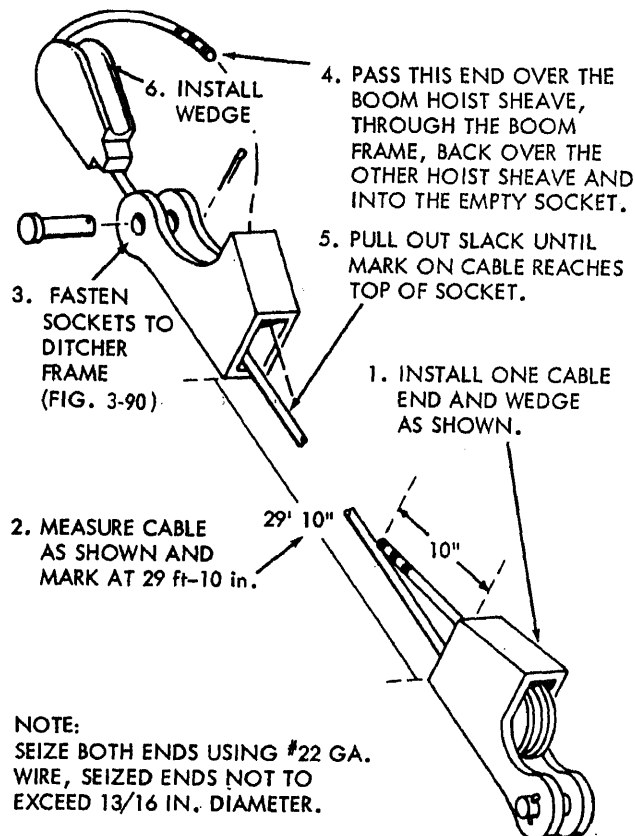
(3) *Lubrication.* Lubricate in accordance with the current lubrication order.

c. Cover Assembly.

(1) *Inspection and Repair.*

(a) Inspect cover assembly for cracked or broken welds.

(b) Inspect sheet metal for breaks, dents or other damage. Repair and repaint as required. Replace badly damaged cover components.



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Figure 3-91. Cable installation.

(2) *Removal.* Refer to figure 3-92 and remove the cover assembly.

(3) *Installation.* Refer to figure 3-92 and install the cover assembly.

d. Head Shaft.

(1) *Inspection.*

(a) Inspect the head shaft for distortion or bending. Report any damage to direct support maintenance.

(b) Inspect bearings for wear or looseness. Be sure bearing housing mounting bolts are tight.

(c) Inspect head shaft sprockets for excessive wear or damage. Report defects to direct support maintenance.

(2) *Lubrication.* Lubricate in accordance with the current lubrication order.

3-81. Bucket Line

a. General.

(1) The bucket line consists of 18 buckets linked together to form a continuous line driven by sprockets on the head shaft.

(2) Each bucket has an offset tooth facing right or left alternately around the bucket line.

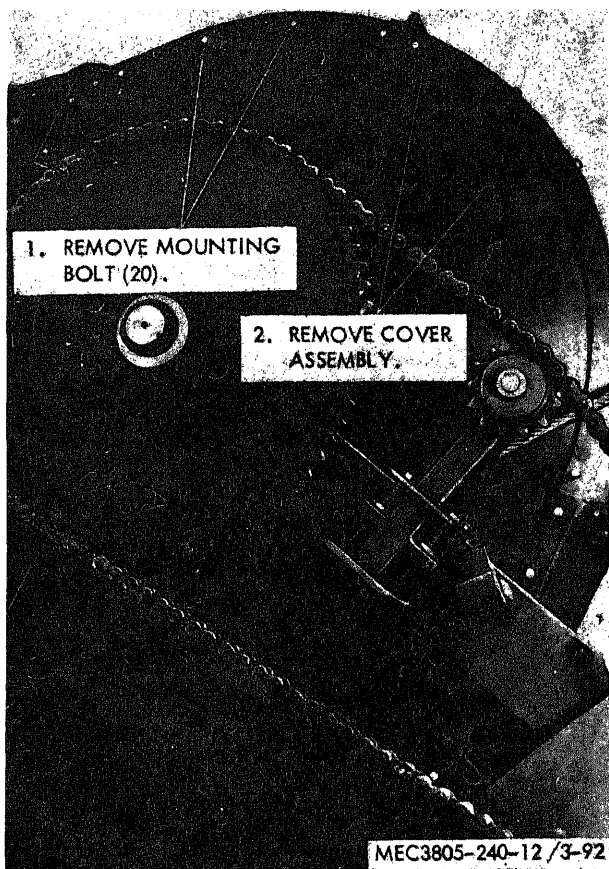


Figure 3-92. Boom cover assembly, removal and installation.

The offset teeth provide clearance on either side of the digging boom to prevent excessive rubbing and wear from the sides of the trench.

(3) Wiper plates eject spoil from the buckets into the conveyor as the buckets pass over the head shaft.

b. Bucket Assembly.

(1) *Cleaning.* Wash mud and dirt from bucket line with water.

(2) *Inspection.*

(a) Inspect bucket teeth for excessive wear or breakage. Replace teeth that are worn down over 3/4 inch.

(b) Inspect buckets for broken welds, badly worn tooth pockets, bushings and damage. Replace defective buckets.

(c) Inspect wiper plates for excessive wear or damage. Replace as required.

(d) Inspect link assembly for worn links, bushings, rollers, and pins. Replace badly worn or damaged parts.

(3) *Tooth replacement.* Refer to figure 3-93 and replace teeth as required.

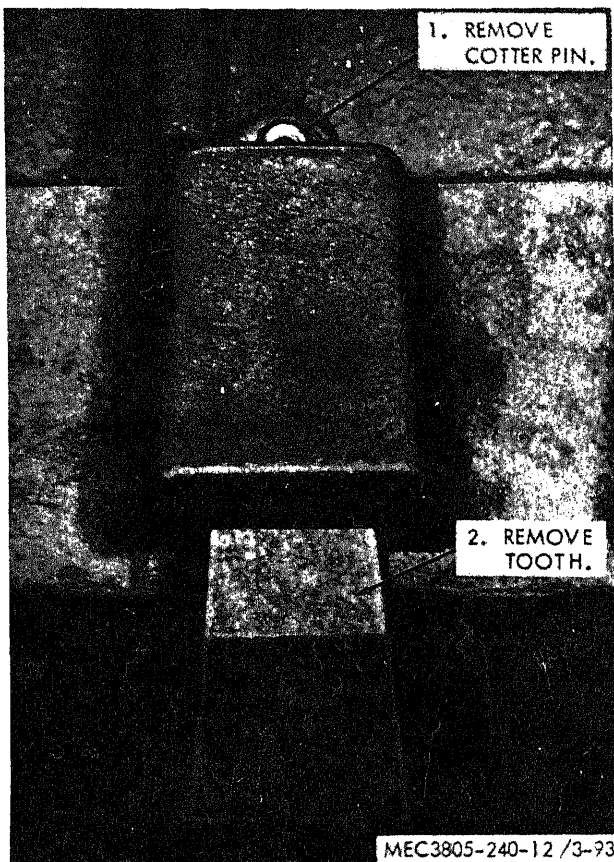


Figure 3-93. Bucket teeth, removal and installation.

(4) *Removal.* Refer to figure 3-94 and remove the bucket assembly.

(5) *Disassembly.* Disassemble the bucket in the numerical sequence as illustrated on figure 3-95.

(6) *Reassembly.* Reassemble the bucket in reverse of the numerical sequence as illustrated on figure 3-95.

(7) *Installation.* Refer to figure 3-94 and install the bucket assembly.

3-82. Drive Chains

a. General. Power is transferred from the right-angle sprocket drive assembly to the bucket line by means of the two drive chains. The drive chains connect the sprockets on the right-angle drive with those on the boom head shaft. An idler sprocket assembly on each spreader arm provides for drive chain adjustment.

b. Removal. Refer to figure 3-96 and remove the drive chains.

c. Cleaning. Wash chains with an approved solvent and dry with compressed air.

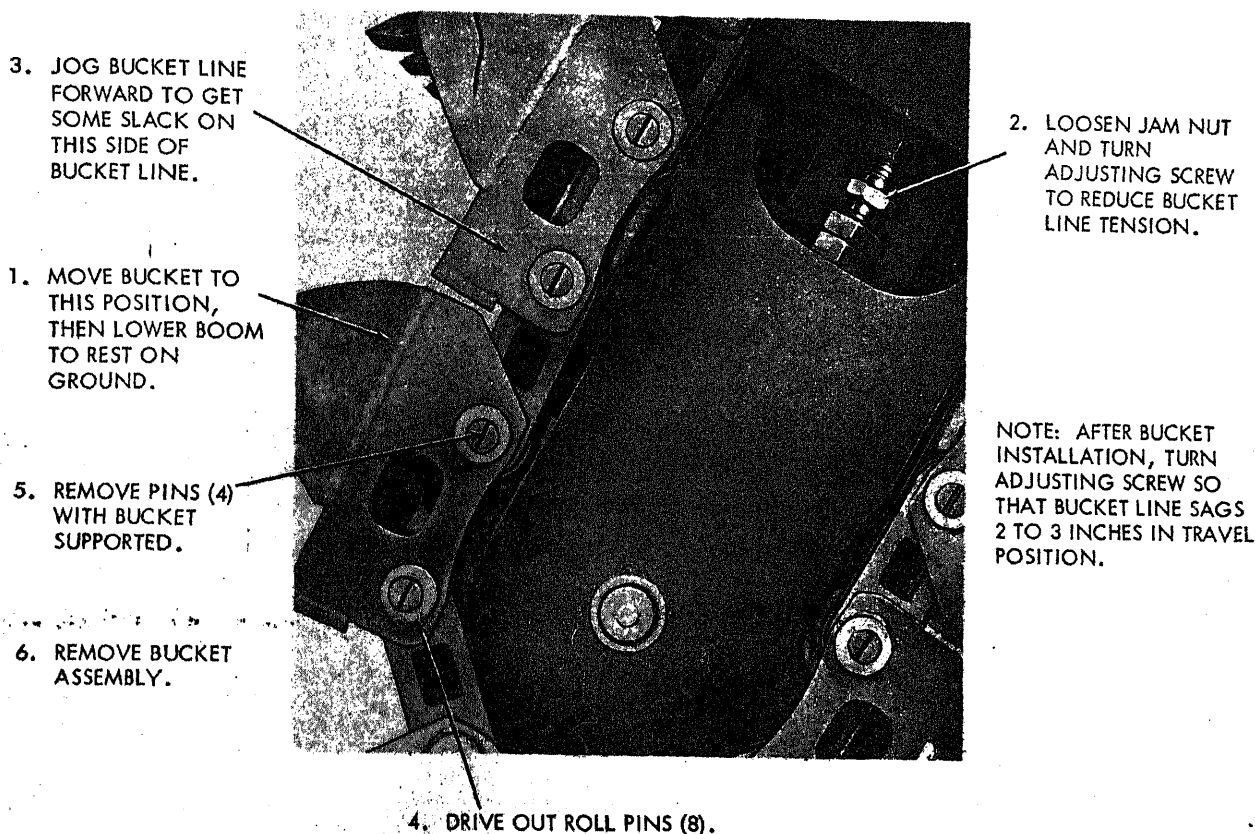


Figure 3-94. Bucket assembly, removal and installation.

d. Inspection.

(1) Inspect the chain for badly worn or damaged links, pins, and rollers.

(2) Be sure rollers have not rusted fast to linkpins. Replace a defective chain. Chain should deflect 1 1/2 to 2 inches between drive sprockets.

(3) Inspect idler sprockets for wear, damage, and correct adjustment. Report defects to direct support maintenance.

e. Installation. Refer to figure 3-96 and install the drive chains.

f. Lubrication. Lubricate in accordance with the current lubrication order.

3-83. Follow-up Scraper Assembly

a. General. The follow-up scraper assembly is mounted under the spoil conveyor and directly behind the bucket line. A hydraulic cylinder lowers the scraper to the operating position and retracts the scraper when not in use. The scraper has a telescoping outer section which covers the entire depth range of the digging boom.

b. Removal.

(1) Lower the follow-up scraper assembly into the operating position.

(2) Support the scraper assembly with a suitable lifting device.

(3) Refer to figure 3-97 and remove the scraper assembly.

c. Disassembly. Disassemble the follow-up scraper in the numerical sequence as illustrated on figure 3-98.

d. Cleaning.

(1) Rinse away loose mud and dirt with water.

(2) Wash metal parts in approved solvent and dry with compressed air.

e. Inspection and Repair.

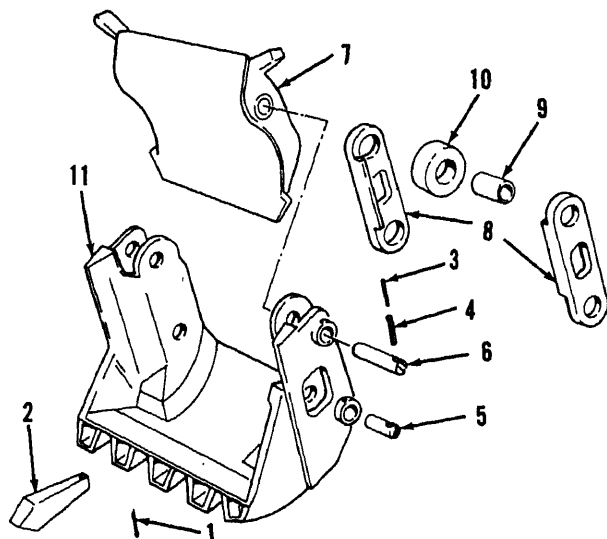
(1) *Outer slide member assembly.*

(a) Inspect the outer slide member (8) for bent or dented parts. Repair by straightening if not too badly damaged.

(b) Repair any cracked or broken welds by rewelding and grinding smooth.

(c) Inspect the roller shafts for scoring, wear, and open lubrication ports. Slight scoring

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- | | |
|-----------------------|---------------|
| 1 Cotterpin (5) | 7 Wiper plate |
| 2 Tooth (5) | 8 Link (4) |
| 3 Roll pin, small (4) | 9 Bushing (4) |
| 4 Roll pin, large (4) | 10 Roller (4) |
| 5 Linkpin, short (2) | 11 Bucket |
| 6 Linkpin, long (2) | |

Figure 3-95. Bucket assembly, exploded view.

can be smoothed with crocus cloth. Badly worn or damaged roller shafts require replacement of the outer slide member assembly.

(d) Replace defective grease fittings.

(e) Repaint as required.

(2) *Inner pivot member assembly.*

(a) Inspect inner pivot member weldment (3) for bends, twists, misalignment, and wear. Replace a pivot member which cannot be repaired by straightening or is badly worn.

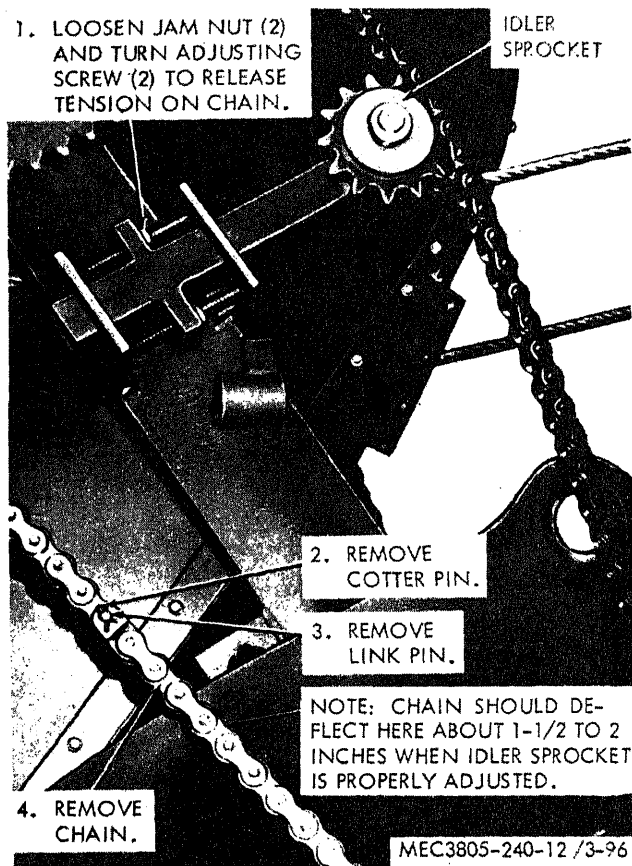
(b) Inspect inner pivot member for cracked or broken welds. Repair by welding and grinding welds smooth.

(c) Inspect the bronze bearings (17) for wear, pitting, and scoring. Replace defective bearings.

(d) Straighten or replace damaged stop bar (7).

(e) Replace any threaded parts which are rusty, damaged or worn.

1. LOOSEN JAM NUT (2) AND TURN ADJUSTING SCREW (2) TO RELEASE TENSION ON CHAIN.



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Figure 3-96. Drive chain, removal and installation.

(g) Inspect the shaft (2) for wear, scoring, or distortion. Light scoring can be smoothed with crocus cloth. Replace badly worn or deformed shaft.

(h) Repaint as required.

f. *Reassembly.* Reassemble the follow-up scraper assembly in reverse of the numerical sequence as illustrated in figure 3-98.

g. *Installation.* Refer to figure 3-97 and install the follow-up scraper assembly.

3-84. Spoil Conveyor Assembly

a. *General.* The spoil conveyor operates just behind the bucket line. Two hydraulic motors drive the conveyor belt in either direction. A third hydraulic motor shifts the conveyor sideways to place the spoil near to or far from the ditch as desired.

b. *Cleaning.*

(1) Clean mud and dirt from belt, flashing and frame with water.

(2) Remove grease, oil and dirt deposits with approved solvent. Dry with compressed air.

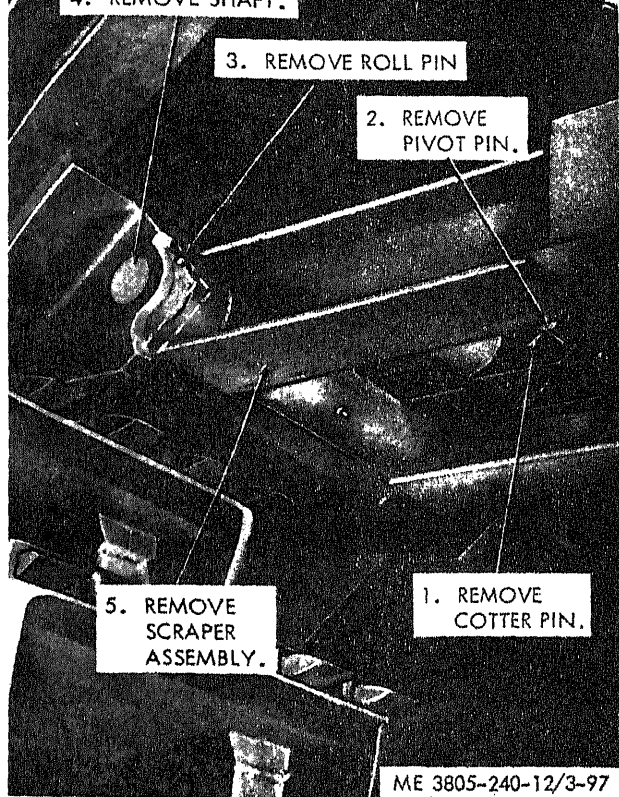


Figure 3-97. Followup scraper assembly, removal and installation.

c. Inspection.

(1) Inspect the belt for excessive wear, damage, proper tension (fig. 3-99) and aline-

ainment as required. Report a badly worn or damaged belt to direct support maintenance.

(2) Inspect hydraulic motors, hoses, and fitting for leaks or damage. Replace defective hoses or fittings. Report defective motors to direct support maintenance.

(3) Inspect drum assemblies and idler rollers for worn out bearings and damage. Report defects to direct support maintenance.

(4) Inspect frame for cracked welds, bent parts, worn or damaged flashing strips, hold-down brackets, and worn or defective shift pin gears and rollers. Report any defects to direct support maintenance.

d. Adjustments.

(1) Belt tension.

(a) Belt should be tight enough to prevent slipping on drums while fully loaded.

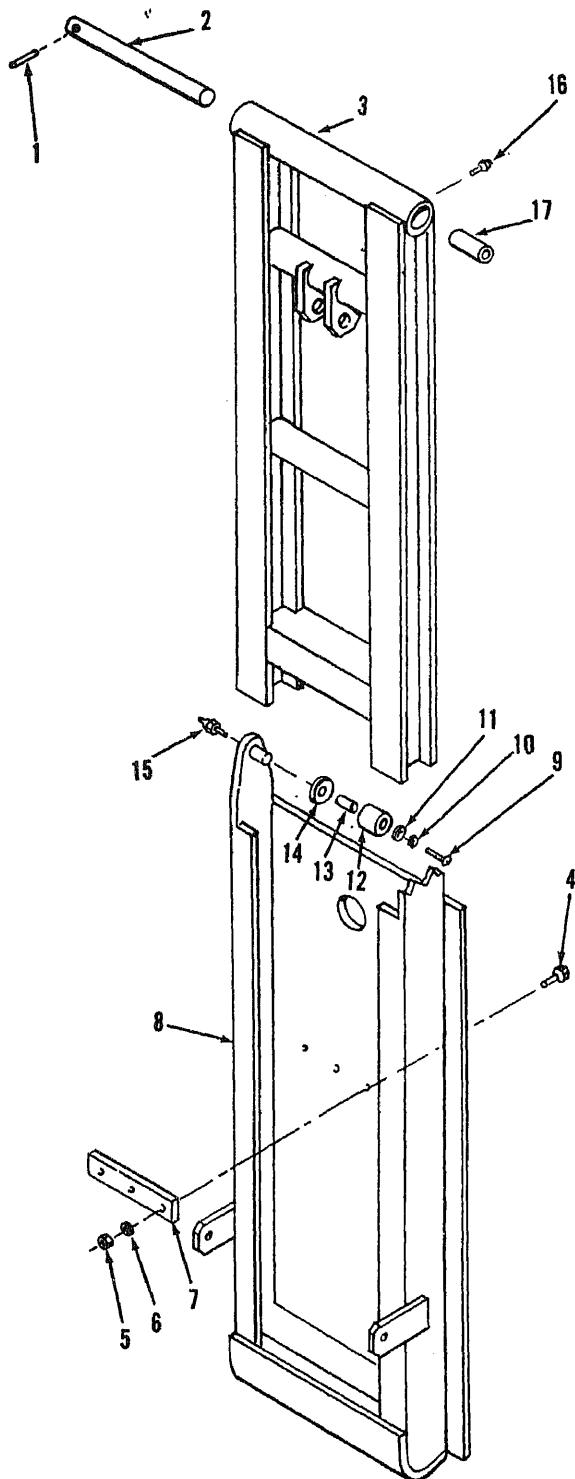
(b) Refer to figure 3-99 and adjust belt tension.

(2) Belt alinement.

(a) After adjusting belt tension, run conveyor belt to be sure belt runs true on drums. If belt moves to one side, it must be re-aligned.

(b) Refer to figure 3-100 and aline the belt.

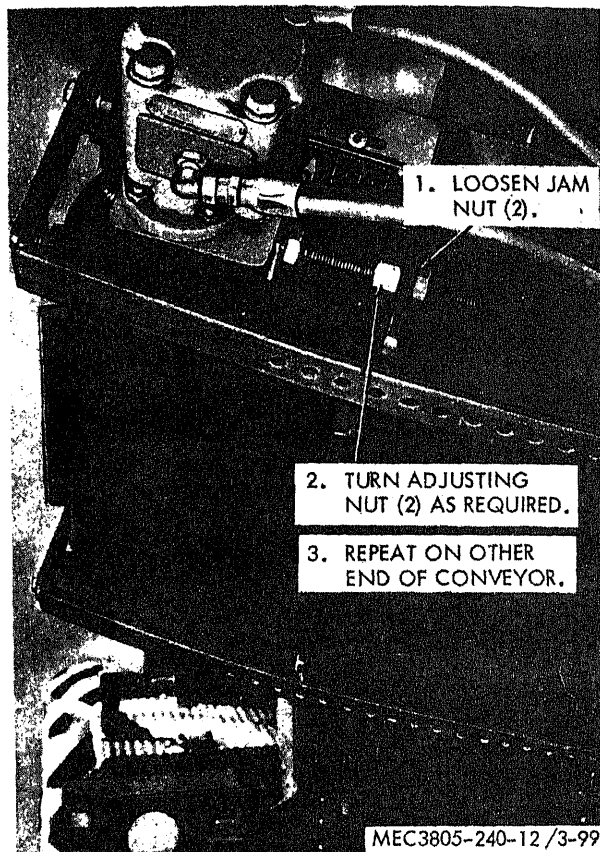
e. Lubrication. Lubricate in accordance with the current lubrication order.



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- | | |
|------------------------------|------------------------------|
| 6 Lockwasher, 5/8 in. (3) | 12 Roller (2) |
| 7 Stop bar | 13 Bushing (2) |
| 8 Outer slide member | 14 Flatwasher, 1 1/4 in. (2) |
| 9 Bolt, 1/2-13 x 5/8 in. (2) | 15 Grease fitting (2) |
| 10 Lockwasher, 5/8 in. (2) | 16 Grease fitting |
| 11 Spacer (2) | 17 Bronze bearing (2) |

Figure 3-98—Continued.



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Figure 3-99. Belt tension adjustment.

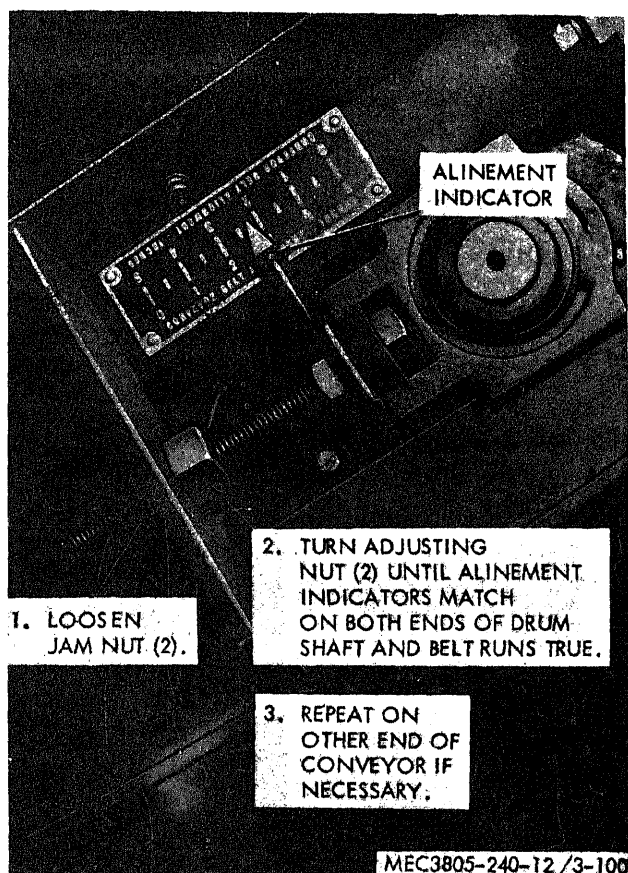


Figure 3-100. Belt alinement.

Section XII. ENGINE ASSEMBLY

3-85. General

The Detroit Diesel Model 6V-71, S-70 Diesel Engine is a vee six cylinder, two cycle, overhead valve engine. It has a pressure-fed fuel circulating system which also cools the fuel injectors. An electric starter provides cranking power, and an alternator and regulator maintain fully charged batteries. A water pump is mounted on the front of the engine to circulate the coolant through the engine and radiator. The alternator and air compressor are driven by means of vee belts from the engine. Engine rotation is left-hand (CCW) when viewed from the flywheel end of the engine.

3-86. Rocker Arm Covers

a. Inspection.

- (1) Inspect covers for damage.
- (2) Inspect condition of gasket and proper fit of cover on head.
- (3) Inspect for oil leaks.

b. Removal.

- (1) Refer to figure 3-132 and remove hood.
- (2) Clean outside of covers with an approved solvent.
- (3) Refer to figure 3-101 and remove covers.

c. *Cleaning.* Clean inside of covers, filler pipe strainer, and filler pipe and cap with an approved solvent. Dry with compressed air.

d. *Installation.* Refer to figure 3-101 and install covers. Be sure cover with oil filler pipe is on left-hand cylinder head.

3-87. Mufflers and Pipes

a. *Inspection.* Inspect for leaking exhaust pipe gaskets and damaged mufflers or pipes.

b. *Removal.* Refer to figure 3-102 and remove muffler and pipes.

c. *Installation.* Refer to figure 3-102 and install muffler and pipes.

3-88. Exhaust Manifold

a. Inspection.

(1) Refer to figure 3-133 and remove access panel.

(2) Inspect for leaks and damage.

b. Removal.

(1) Refer to figure 3-102 and remove exhaust pipe.

(2) Refer to figure 3-103 and remove manifold.

c. Installation.

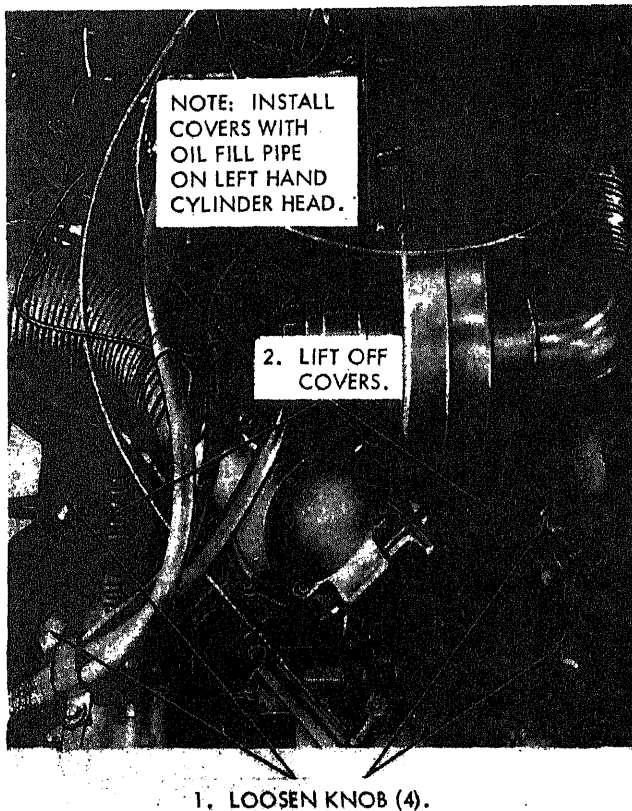
(1) Refer to figure 3-103 and install manifold.

(2) Refer to figure 3-102 and install exhaust pipe.

3-89. Oil Pan Inspection

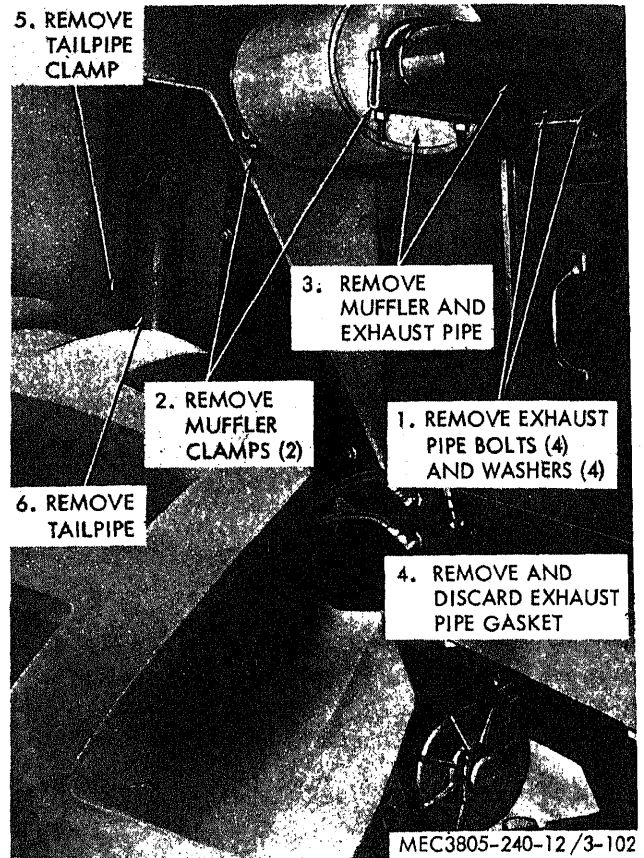
a. Inspect oil pan drain plugs (2) and gasket for leaks. Tighten loose bolts.

b. Inspect oil pan for damage. Report damage to direct support maintenance.



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Figure 3-101. Rocker arm covers, removal and installation.



MEC3805-240-12/3-102

Figure 3-102. Muffler and pipes, removal and installation.

3-90. Crankcase Breather Tube

a. Inspection. Inspect tube for damage and tighten loose fittings. Replace damaged tube.

b. Removal. Refer to figure 3-104 and remove tube.

c. Installation. Refer to figure 3-104 and install tube.

3-91. Air Inlet Housing Assembly

a. Inspection.

(1) Inspect emergency shut-down valve latch and linkage for proper operation.

(2) Inspect housing for leaks or damage. Replace defective housing assembly.

b. Removal. Refer to figure 3-105 and remove housing assembly.

c. Installation. Refer to figure 3-105 and install housing assembly.

3-92. Engine Governor

a. Testing.

(1) Use an accurate hand tachometer to test the maximum no-load speed (2,240 rpm) at the crankshaft pulley.

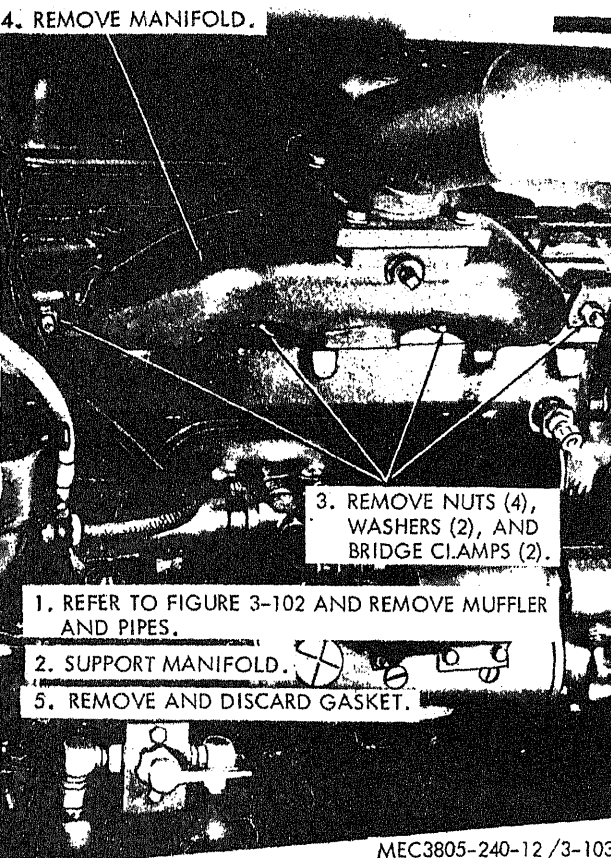


Figure 3-103. Exhaust manifold, removal and installation.

(2) Repeat the test for proper idle speed (550 rpm).

b. Adjustment.

(1) Refer to figure 3-106 and adjust idle speed screw.

(2) Refer to figure 3-107 and adjust buffer screw.

(3) Refer to figure 3-108 and adjust maximum no-load speed screw.

(4) Refer to figure 3-109 and adjust governor gap screw.

(5) Refer to figure 3-110 and adjust booster spring.

93. Crankshaft Pulley Inspection

Inspect pulley for cracks, chips, and alignment. Report defects to direct support maintenance.

94. Alternator Drive Pulley Inspection

Inspect pulley for cracks, chips, and alignment.

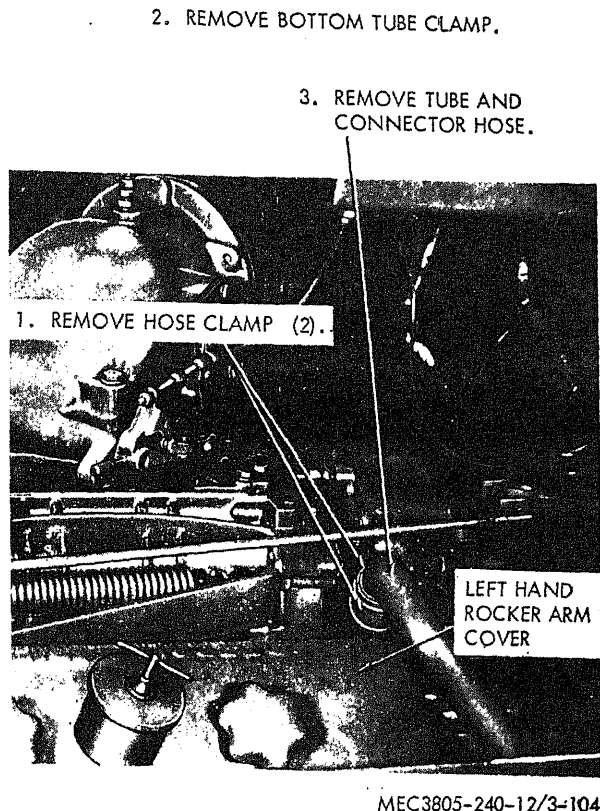


Figure 3-104. Crankcase breaker tube, removal and installation.

3-95. Engine Oil Filter Assembly

a. Service. Refer to figure 3-112 and service filter assembly.

b. Removal. Refer to figure 3-113 and remove filter assembly.

c. Installation. Refer to figure 3-113 and install filter assembly.

3-96. Engine Air Cleaner Assembly

a. Inspection.

(1) Inspect the air cleaner and restriction indicator for visible damage. Tighten loose mounting bolts, screws and fittings. Replace a damaged air cleaner or restriction indicator.

(2) Inspect hoses, flexible tubing, and fittings for leaks and damage. Tighten loose hose clamps. Replace defective parts.

b. Service.

(1) Refer to figure 3-114 and service the air cleaner.

(2) The filter element is reusable and can be cleaned by either of the following methods:

5. REMOVE AIR INLET HOUSING BOLTS (6) AND WASHERS (6).

1. REMOVE QUICK START ATOMIZER.

2. REMOVE AIR DUCT FLANGE BOLT (6) AND WASHER (6).

6. REMOVE AIR INLET HOUSING AND GASKET.

4. REMOVE CONTROL ROD MOUNTING PLATE BOLTS (2) AND WASHERS (2).

3. REMOVE CONTROL ROD ELASTIC STOP NUT.

MEC3805-240-12/3-105

Figure 3-105. Air inlet housing assembly, removal and installation.

(a) Carefully aim compressed air up and down pleats on the inside of the element. Do not rub nozzle against the element. Air pressure must not exceed 100 psi.

(b) Soak the element at least 15 minutes in an approved solvent. Rinse the element thoroughly with clean water from a hose. Water pressure must not exceed 40 psi. The element must be completely dry before reinstalling. An electric bulb or other heat source may be used but the temperature must not exceed 150° F.

(3) Discard the element after 6 cleanings or yearly, whichever comes first.

(4) When the element is clean and dry, place a bright light inside the element and inspect for damage. The slightest rupture requires replacement of the element.

c. Removal.

(1) Refer to figure 3-133 and remove engine access panel.

(2) Refer to figure 3-115 and remove air cleaner assembly.

d. Installation. Refer to figure 3-115 and install air cleaner assembly.

1. PLACE STOP LEVER IN "RUN" POSITION.

3. WITH ENGINE RUNNING, LOOSEN THE LOCK NUT AND TURN THE IDLE ADJUSTMENT UNTIL THE ENGINE IDLES AT 550 RPM.

4. HOLD IDLE ADJUSTING SCREW AND TIGHTEN LOCK NUT.

2. PLACE SPEED CONTROL LEVER IN "IDLE" POSITION.

MEC3805-240-12/3-106

Figure 3-106. Engine idle speed adjustment.

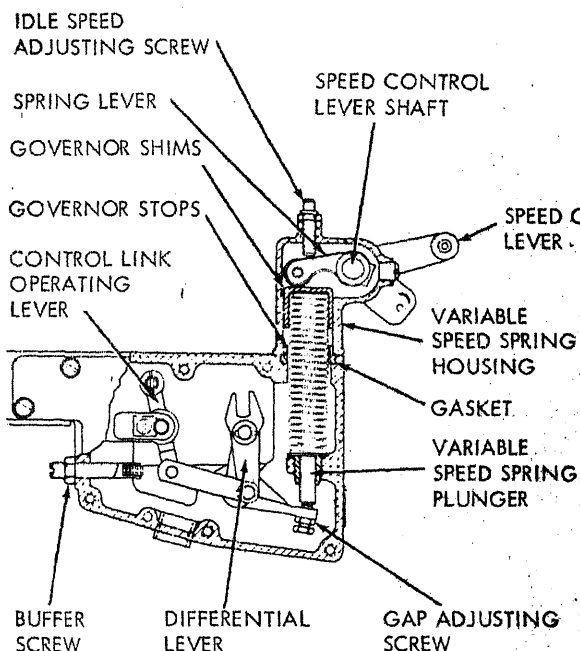
1. WITH ENGINE AT IDLE SPEED, LOOSEN LOCK NUT AND TURN BUFFER SCREW IN UNTIL IT CONTACTS THE DIFFERENTIAL LEVER AS LIGHTLY AS POSSIBLE AND STILL ELIMINATES ENGINE ROLL.

2. HOLD BUFFER SCREW AND TIGHTEN LOCK NUT.

NOTE: DO NOT RAISE ENGINE IDLE SPEED MORE THAN 15 RPM WITH BUFFER SCREW.

MEC3805-240-12/3-107

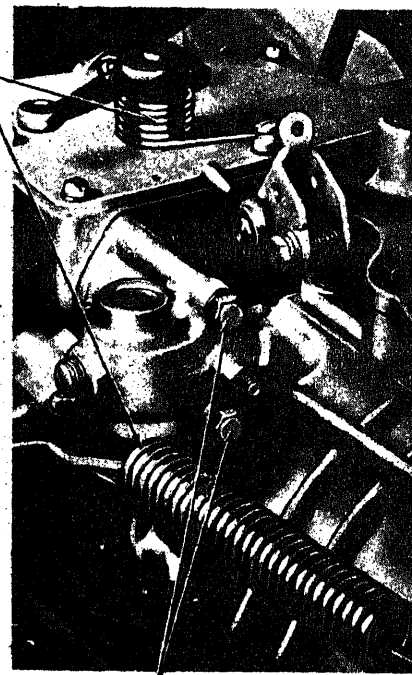
Figure 3-107. Buffer screw adjustment.



1. DISCONNECT THE BOOSTER SPRING AND THE TORSION RETRACTION SPRING.

3. ADD OR REMOVE SHIMS TO OBTAIN THE CORRECT OPERATING SPEED. EACH .010" SHIM WILL CHANGE SPEED APPROXIMATELY 10 RPM (UP TO .325" MAX.).

4. INSTALL HOUSING AND RECHECK SPEED.



2. REMOVE BOLT (2) AND WASHER (2) AND REMOVE VARIABLE SPEED HOUSING FROM GOVERNOR HOUSING.

NOTE: THE MAXIMUM NO-LOAD SPEED ON ENGINE WITH VARIABLE SPEED GOVERNOR MUST NOT BE MORE THAN 140 RPM ABOVE FULL LOAD SPEED OF 2100 RPM. USE AN ACCURATE HAND TACHOMETER AND DETERMINE THE MAXIMUM NO-LOAD SPEED OF THE ENGINE. IF NOT 2240 RPM, MAKE THE FOLLOWING ADJUSTMENTS.

MEC3805-240-12 /3-108

Figure 3-108. Engine maximum no-load speed adjustment.

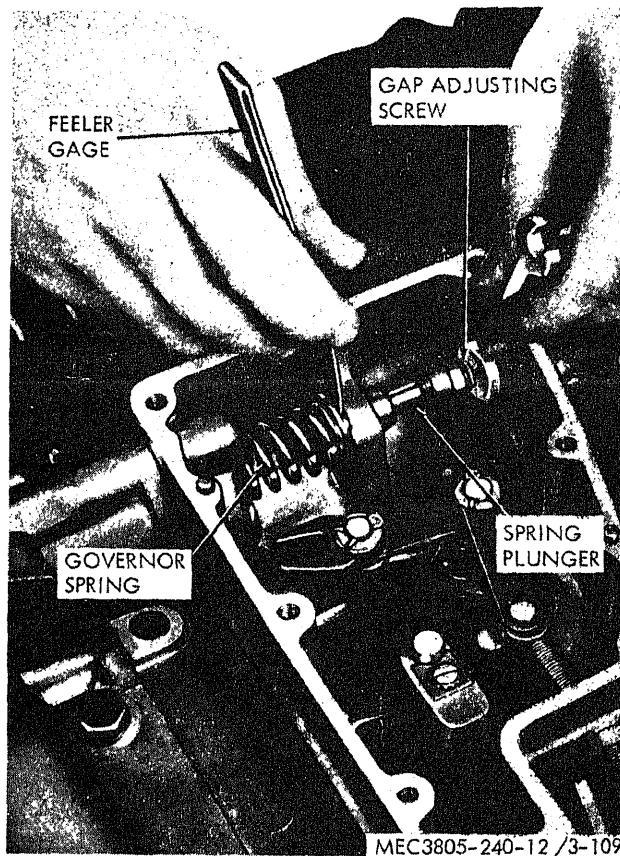
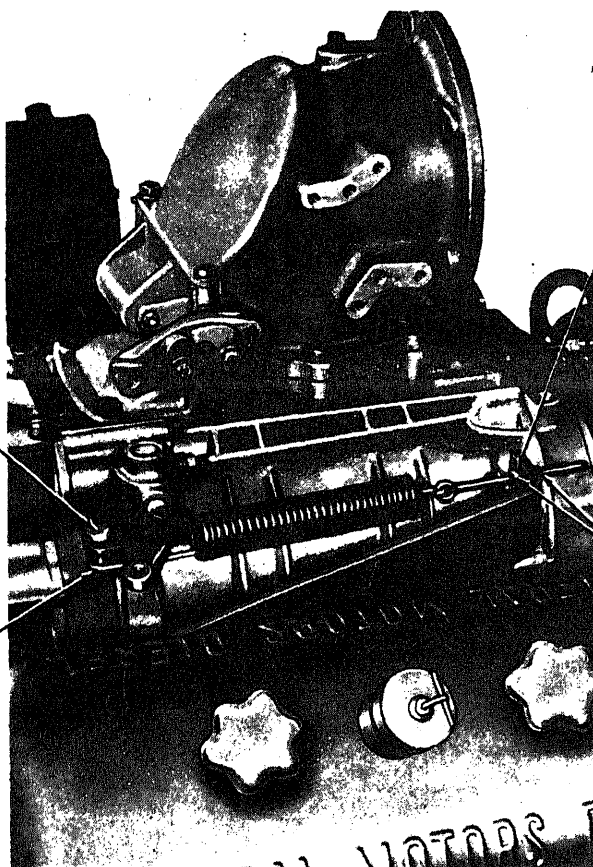


Figure 3-109. Governor gap adjustment.

3. WITH THE SPEED CONTROL IN THE IDLE POSITION, MOVE THE BOLT IN THE SPEED CONTROL LEVER SLOT UNTIL THE BOLT IS ON AN IMAGINARY LINE FROM THE EYE BOLT THROUGH THE CENTER LINE OF LEVER SHAFT AND TIGHTEN THE LOCK NUT.

1. LOOSEN THE BOOSTER SPRING RETAINER NUT ON THE SPEED CONTROL LEVER.



2. LOOSEN LOCK NUT (2) ON THE EYE BOLT AT OPPOSITE END OF SPRING.

4. START THE ENGINE AND MOVE THE SPEED CONTROL LEVER TO THE MAXIMUM SPEED POSITION AND RELEASE. THE SPEED CONTROL LEVER SHOULD RETURN TO THE IDLE POSITION. IF IT DOES NOT, REDUCE THE BOOSTER SPRING TENSION; IF IT DOES, CONTINUE TO INCREASE THE SPRING TENSION UNTIL THE POINT IS REACHED THAT IT WILL NOT RETURN TO IDLE. THEN, REDUCE THE TENSION UNTIL IT DOES RETURN TO IDLE AND TIGHTEN THE LOCK NUT ON THE EYE BOLT. THIS SETTING WILL RESULT IN THE MINIMUM FORCE REQUIRED TO OPERATE THE SPEED CONTROL LEVER.

MEC3805-240-12 /3-110

Figure 3-110. Booster spring adjustment.

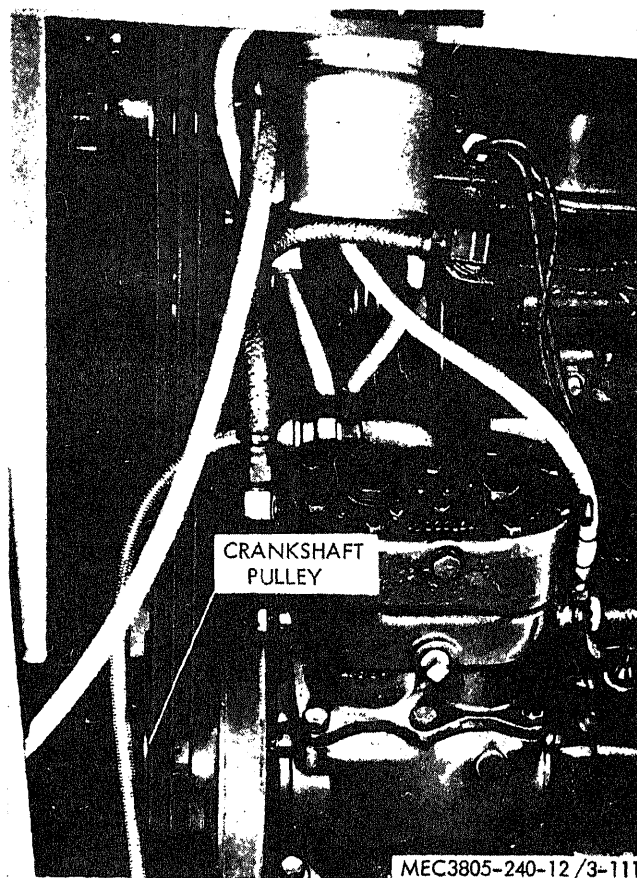
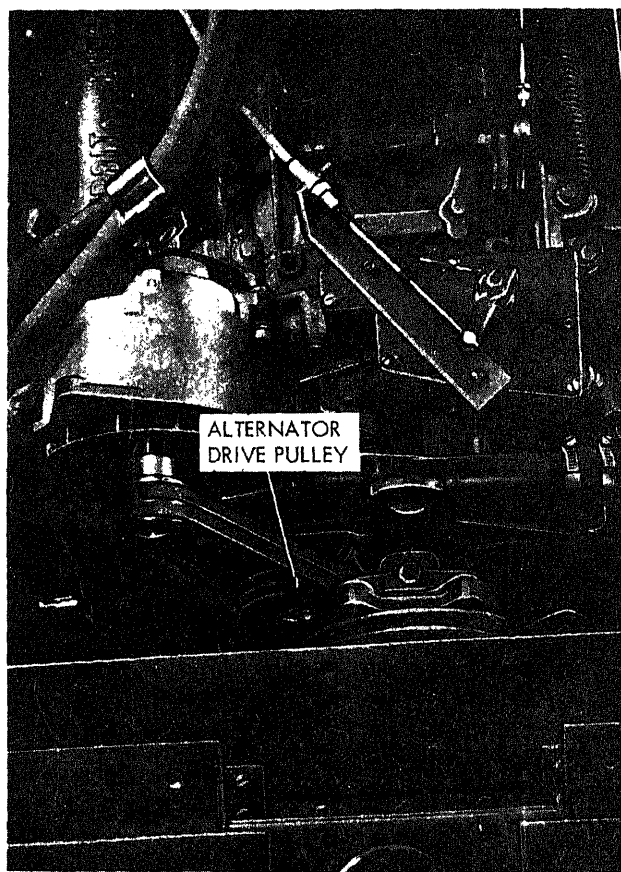
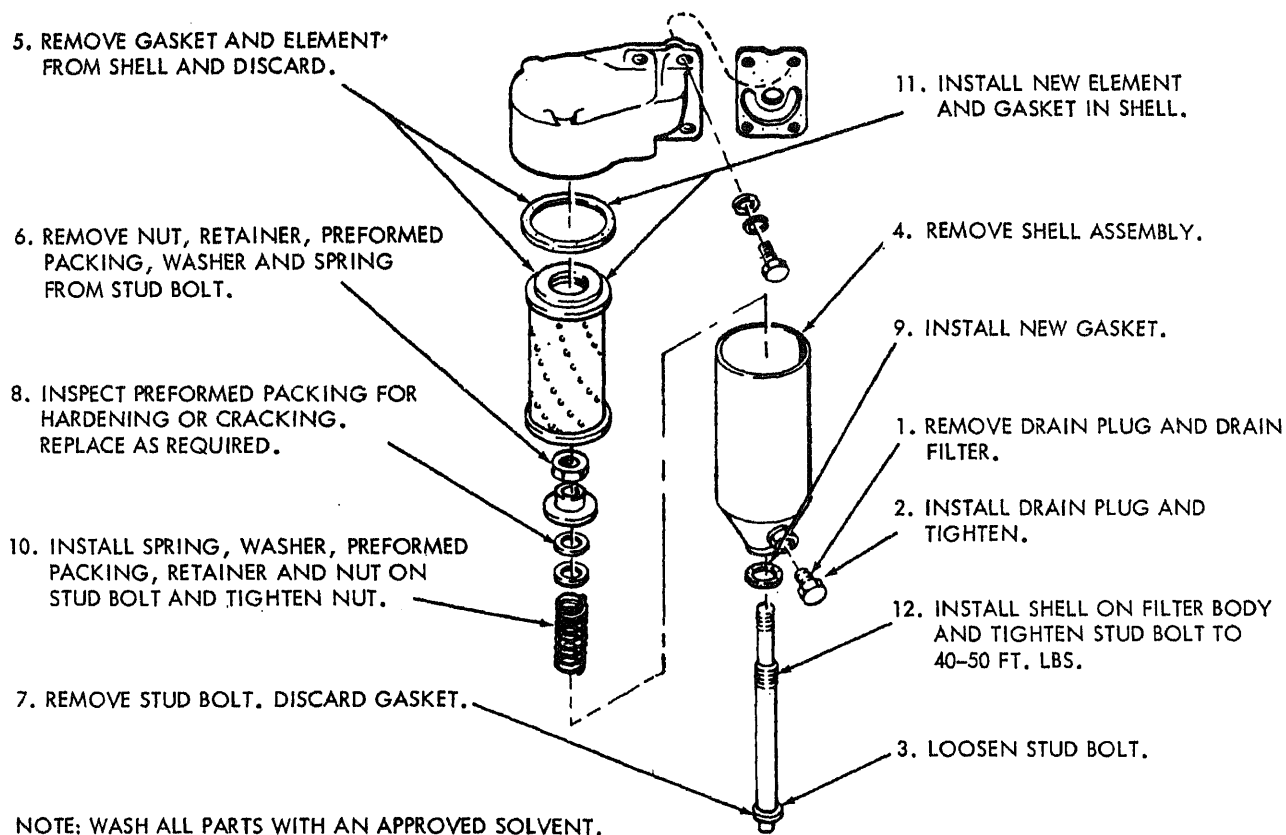


Figure 3-111. Crankshaft and alternator drive pulley.



MEC3805-240-12 /3-112

Figure 3-112. Engine oil filter service.

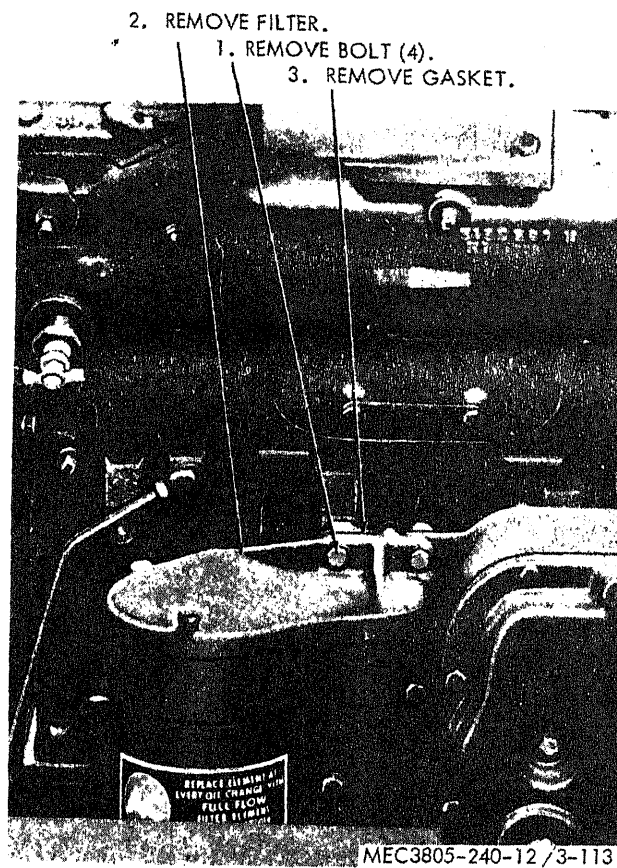


Figure 3-113. Engine oil filter assembly, removal and installation.

3. CHECK AIR RESTRICTION INDICATOR. IF RED SIGNAL IS IN FULL VIEW, REMOVE AND CLEAN THE FILTER ELEMENT.

1. LOOSEN SCREW AND REMOVE CUP CLAMP.

2. REMOVE AND EMPTY DUST CUP DAILY. INSTALL WITH ARROWS POINTING UP AS SHOWN.



4. REMOVE AND CLEAN THE INLET CAP.

5. WIPE INSIDE OF BODY WITH A CLEAN, DAMP CLOTH.

6. TIGHTEN LOOSE MOUNTING BOLTS.

MEC3805-240-12 /3-114

Figure 3-114. Air cleaner service.

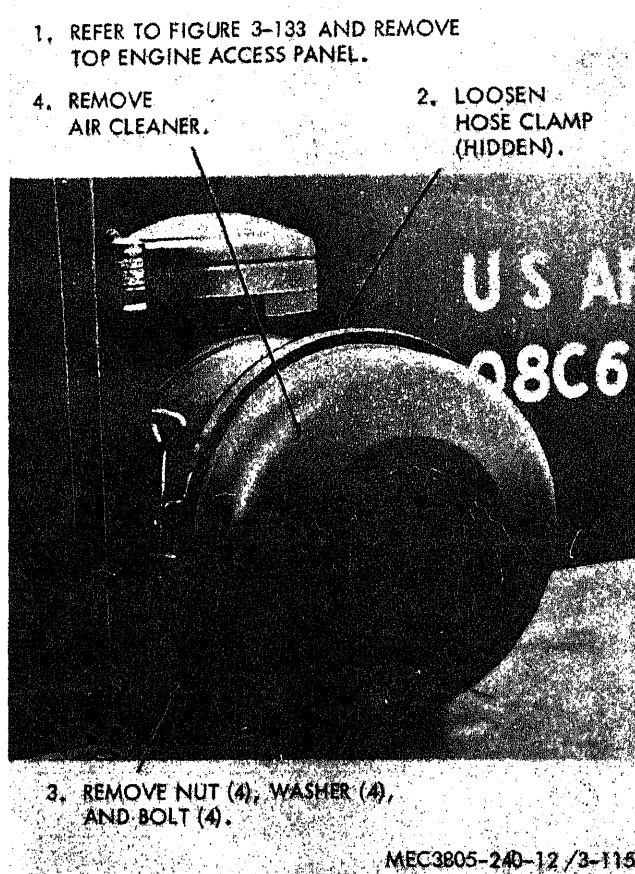


Figure 3-115. Air cleaner, removal and installation.

Section XIII. TRANSMISSION/TORQUE CONVERTER

3-97. General

a. The transmission/torque converter transmits power from the engine to the transfer case. The manual shift lever provides a range of six forward speeds, neutral, and reverse. The transmission/torque converter requires no clutch pedal since it is manually actuated but operates hydraulically. A power take-off device driven by the transmission operates two hydraulic pumps.

b. The following safety devices and interlocks operate in conjunction with the transmission/torque converter.

(1) Neutral starting switch-prevents starting engine if shift lever is not in neutral.

(2) Down-shift inhibitor-prevents engine damage from shifting to a lower gear at too high an engine speed.

(3) Pilot air valve-prevents operation of bucket line in fourth, fifth, and sixth gear.

3-98. Shift Lever and Linkage Assembly

a. General.

(1) The shift lever on the pedestal in the

cab operates a control cable which moves a lever on the transmission.

(2) The transmission lever turns a shaft on the left hand side of the transmission to select the range desired.

b. Inspection.

(1) Inspect shift lever and pedestal for excessive wear, damage, and broken parts. Replace defective parts.

(2) Inspect control cable and transmission lever for rust, damage, wear, and proper adjustment. Replace defective parts and adjust.

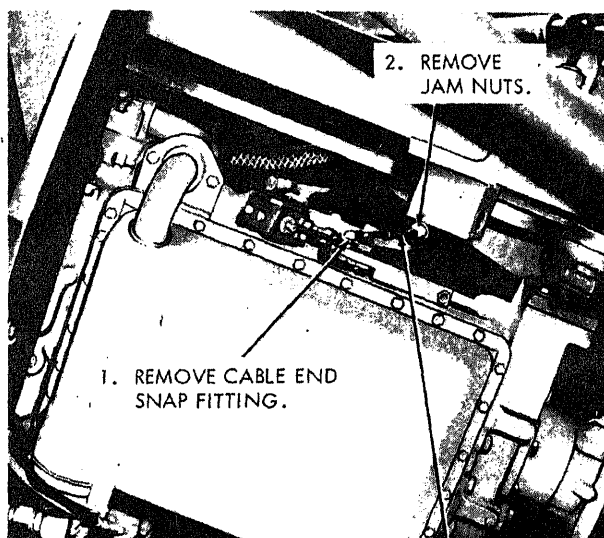
c. Removal. Refer to figure 3-116 and remove the shift lever cable assembly.

d. Installation. Refer to figure 3-116 and install the shift lever cable assembly.

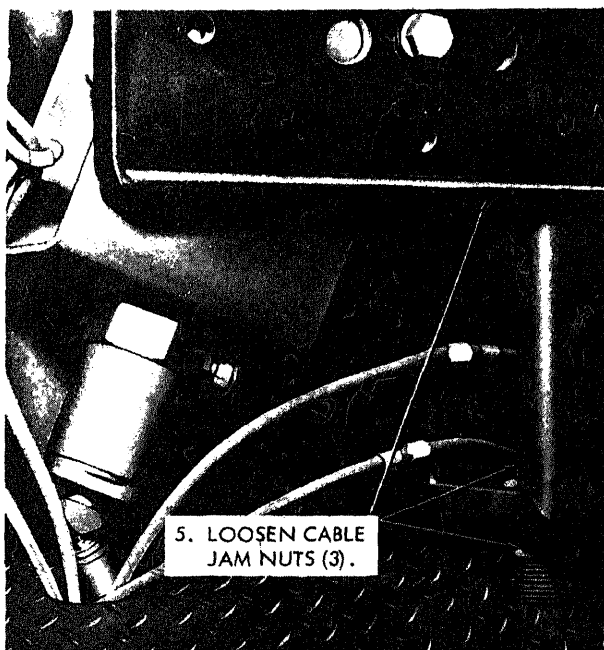
e. Adjustment. Refer to figure 3-117 and adjust the shift lever and linkage assembly.

3-99. Transmission/Torque Converter

a. Cleaning. Remove dirt, grease, and oil deposits with an approved solvent and dry with compressed air.



4. REMOVE LEFT-HAND MOUNTING BRACKET



6. UNSCREW UPPER CABLE END FROM CABLE TERMINAL.

7. REMOVE CABLE ASSEMBLY.

MEC3805-240-12 / 3-116

Figure 3-116. Shift lever cable assembly, removal and installation.

b. Inspection.

(1) Inspect transmission/torque converter housing and oil pan for leaks or damage.

(2) Tighten any loose mounting bolts on transmission housing, power take-off, cover plates, and mounting brackets.

(3) Inspect hoses, tubes, and fittings for leaks, damage, or deterioration. Tighten or replace parts as required.

c. Lubrication. Lubricate in accordance with current lubrication order.

3-100. Breather

a. Removal. Refer to figure 3-118 and remove the breather.

b. Cleaning. Wash breather and screen in approved solvent. Dry with compressed air.

c. Inspection.

(1) Inspect breather for rust or damage.

(2) Inspect screen for damage or deterioration. Replace defective breather or screen.

d. Installation. Refer to figure 3-120 and install the filter assembly.

3-101. Pressure Filter Assembly

a. Inspection.

(1) Remove left access panel (para 3-115).

(2) Inspect for leaks or damage. Tighten loose mounting bolts. Replace a damaged filter assembly.

b. Service. Refer to figure 3-119 and service the filter.

c. Removal. Refer to figure 3-120 and remove the filter assembly.

d. Installation. Refer to figure 3-120 install the filter assembly.

3-102. Neutral Starting Switch

a. General. The neutral starting switch is mounted in the shift lever pedestal in the operator's cab. A cam surface on the down-shift inhibitor ratchet closes the normally open switch contacts when the shift lever is in neutral.

b. Inspection.

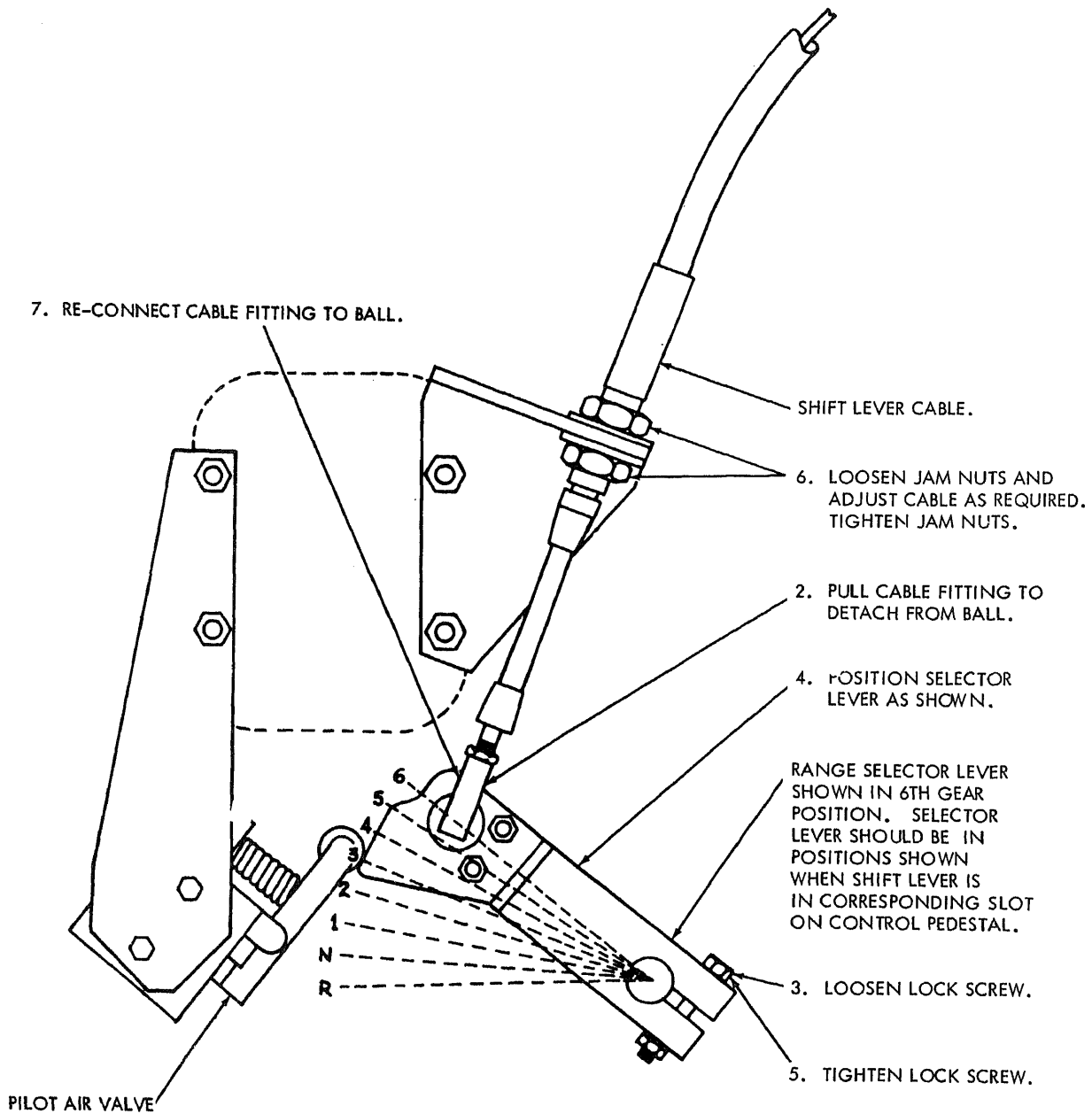
(1) Remove the left hand mounting bracket.

(2) Inspect wiring for loose connections, worn or deteriorated insulation, or broken wires. Repair as required.

(3) Inspect the switch and mounting bracket for loose mounting screws and damage. Replace a defective switch.

c. Removal. Refer to figure 3-121 and remove the neutral starting switch.

1. MOVE SHIFT LEVER IN CAB TO 6th GEAR.



MEC3805-240-12 /3-117

Figure 3-117. Shift lever and linkage assembly adjustment.

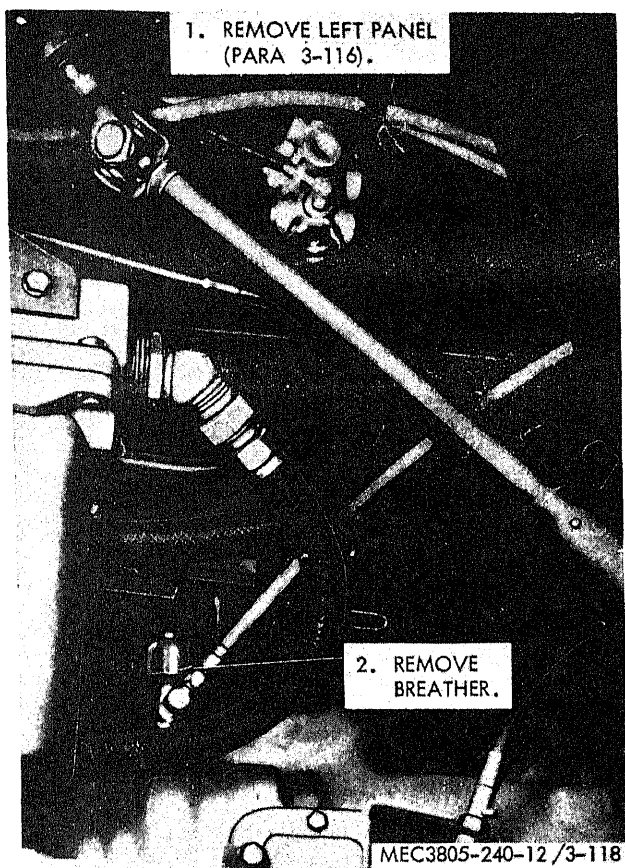


Figure 3-118. Breather, removal and installation.

d. Installation. Refer to figure 3-121 and install the neutral starting switch.

3-103. Down-Shift Inhibitor

a. General.

(1) The down-shift inhibitor consists of a ratchet and pawl assembly built into the shift lever assembly.

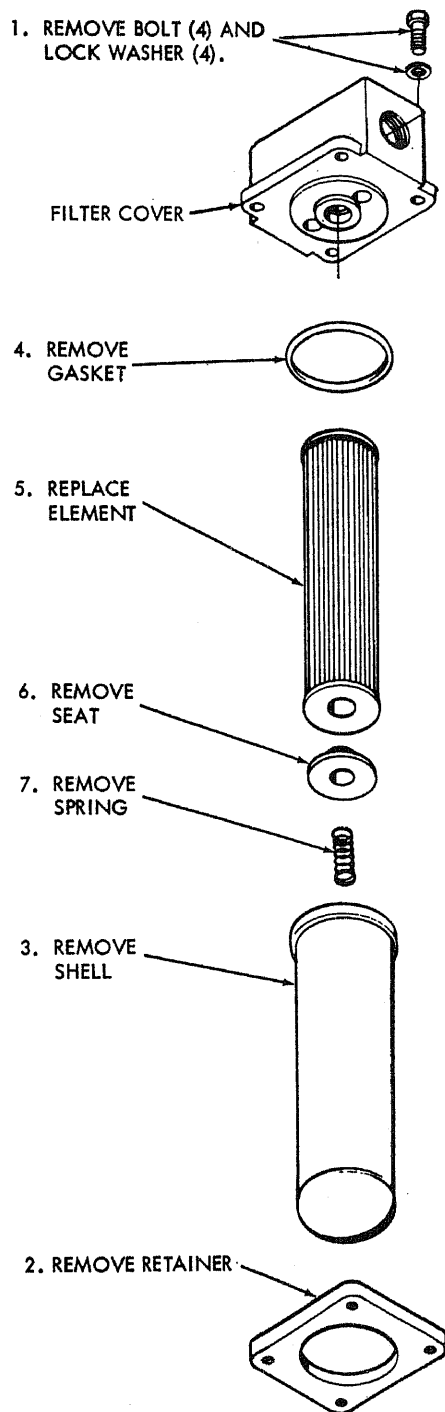
(2) The pawl is actuated by oil pressure from the transmission so that down-shifting must be done at the proper engine speed (table 3-1).

b. Inspection.

(1) Inspect oil hose and fittings for leaks or damage. Tighten loose fitting and replace damaged hose as required.

(2) Inspect ratchet and pawl mechanism for wear or damage and tighten loose mounting screws. Replace defective parts.

c. Removal. Refer to figure 3-122 and remove the down-shift inhibitor.



MEC3805-240-12/3-119

Figure 3-119. Transmission pressure filter service.



Figure 3-120. Pressure filter, removal and installation.

Table 3-1. Transmission Shift Data

| Maximum down-shift speeds | | |
|---------------------------|-----|----------------|
| Gear shift range | mph | rpm |
| 6th to 5th | 20 | 1,550 to 1,600 |
| 5th to 4th | 15 | 1,550 to 1,600 |
| 4th to 3rd | 10 | 1,550 to 1,600 |
| 3rd to 2nd | 7.5 | 1,550 to 1,600 |
| 2nd to 1st | 5 | 1,550 to 1,600 |
| 1st to Neut. | 3 | 1,550 to 1,600 |
| Neut. to Rev. | 0 | 550 |

| Maximum bucket line speeds | | |
|----------------------------|----------------|-------|
| Gear shift range | Ft. per minute | rpm |
| 1st | 180 | 2,100 |
| 2nd | 255 | 2,100 |
| 3rd | 360 | 2,100 |

d. Installation. Refer to figure 3-122 and install the down-shift inhibitor.

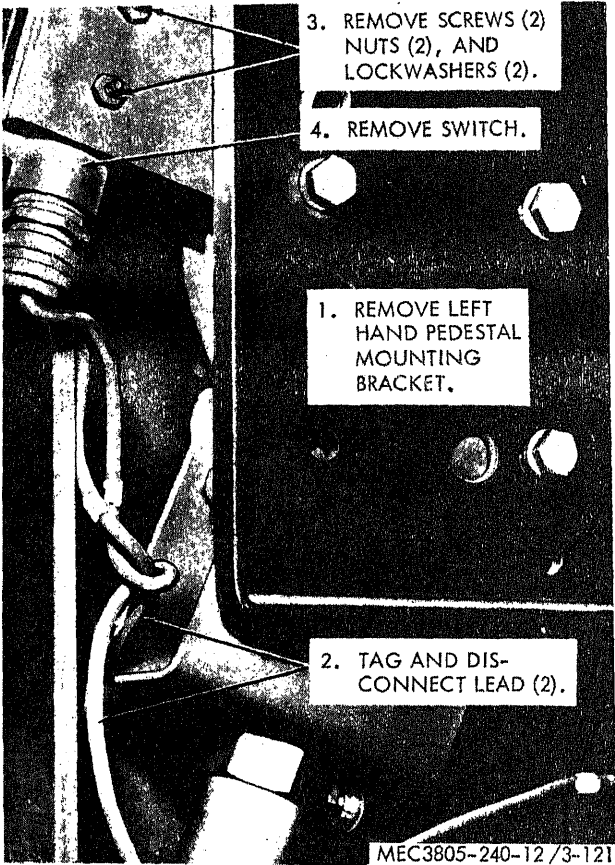


Figure 3-121. Neutral starting switch, removal and installation.

3-104. Pilot Air Valve

a. General.

(1) The pilot air valve is mounted next to the range selector lever on the left-hand side of the transmission.

(2) A cam fastened to the selector lever closes the pilot air valve when the selector lever is in fourth, fifth, and sixth gear. At the lower speed ranges air pressure can be applied to the power cluster to operate the bucket line drive clutch on the transfer case. The power cluster is actuated by the bucket line control knob at the digging station.

b. Inspection.

(1) Inspect the pilot air valve for excessive wear on roller damage. Tighten loose mounting bolts and replace a damaged or worn valve assembly as required.

c. Removal. Refer to figure 3-123 and remove the pilot air valve assembly.

d. Installation. Refer to figure 3-123 and install the pilot air valve assembly.



Figure 3-122. Down-shift inhibitor assembly, removal and installation.

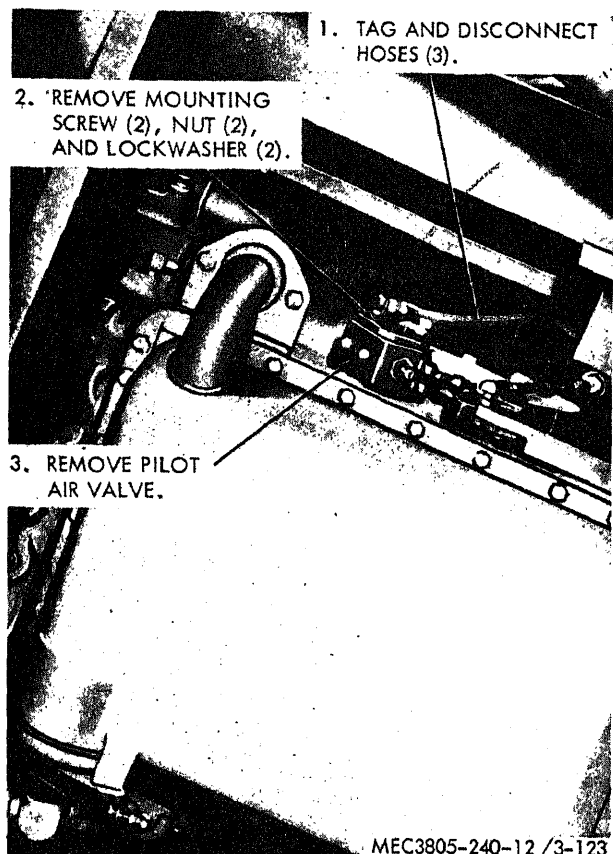


Figure 3-123. Pilot air valve, removal and installation.

Section XIV. BODY AND CAB ASSEMBLY

3-105. General

a. This section describes the sheet metal components used on the ditching machine.

b. The body consists of fenders, hood assembly, access panels, grille, battery compartment, light housings, and tool box.

c. The cab assembly consists of control panels, instrument panels, canvas, canvas frame, windshield, cab, floor plates, mirror brackets, and seats.

3-106. Grille

a. *Cleaning and Inspection.*

(1) Clean grille with approved cleaning solvent.

(2) Inspect grille for dents, broken welds, and rust. Tighten loose mounting screws, replace defective parts.

b. *Removal.* Refer to figure 3-124 and remove the grille.

c. *Installation.* Refer to figure 3-124 and install the grille.

3-107. Headlight Housing Assembly

a. *Cleaning and Inspection.*

(1) Clean headlight housing with approved cleaning solvent.

(2) Inspect headlight housing for dents, broken welds, and rust. Tighten loose mounting screws. Replace defective parts.

b. *Removal.* Refer to figure 3-125 and remove the headlight housing assembly.

c. *Installation.* Refer to figure 3-125 and install the headlight housing assembly.

3-108. Rear Light Housing Assembly

a. *Cleaning and Inspection.*

(1) Clean rear light housing with approved cleaning solvent.

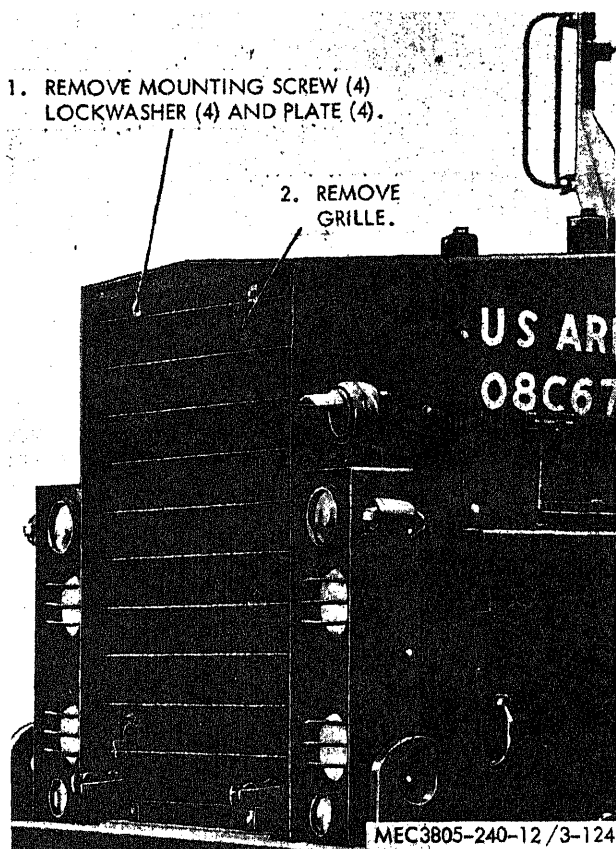


Figure 3-124. Grille, removal and installation.

(2) Inspect light housing for dents, broken welds, and rust. Tighten loose screws. Replace defective parts.

b. Removal. Refer to figure 3-126 and remove the rear light housing assembly.

c. Installation. Refer to figure 3-126 and install the rear light housing assembly.

3-109. Front Clearance Marker Light Housing

a. Cleaning and Inspection.

(1) Clean front clearance marker light housing with approved cleaning solvent.

(2) Inspect front clearance light housing for dents, broken welds and rust. Tighten loose screws. Replace defective parts.

b. Removal. Refer to figure 3-127 and remove front clearance marker light housing.

c. Installation. Refer to figure 3-127 and install front clearance marker light housing.

3-110. Front Fenders

a. Cleaning and Inspection.

(1) Clean fenders with approved cleaning solvent.

(2) Inspect for dents, broken welds, and rust. Tighten loose screws. Replace a badly damaged fender.

b. Removal.

(1) Refer to paragraph 3-96 and remove aircleaner assembly. (front right fender only).

(2) Refer to figure 3-128 and remove the fender.

c. Installation.

(1) Refer to figure 3-128 and install fender.

(2) Refer to paragraph 3-96 and install air cleaner assembly (front right fender only).

3-111. Center Fender

a. Cleaning and Inspection.

(1) Clean center fender with approved cleaning solvent.

(2) Inspect for dents, broken welds, and rust. Tighten loose screws. Replace a badly damaged fender.

b. Removal. Refer to figure 3-129 and remove center fender.

c. Installation. Refer to figure 3-129 and install center fender.

3-112. Rear Fenders

a. Cleaning and Inspection.

(1) Clean rear fenders with approved cleaning solvent.

(2) Inspect rear fenders for dents, broken welds, and rust. Tighten loose screws. Replace badly damaged parts.

b. Removal.

(1) Refer to paragraph 2-13 and lock the boom guide assembly in the digging position.

(2) Refer to figure 3-126 and remove rear light housing assembly.

(3) Refer to figure 3-130 and remove rear fender.

c. Installation.

(1) Refer to figure 3-130 and install rear fender.

(2) Refer to figure 3-126 and install rear light housing assembly.

(3) Refer to paragraph 2-13 and lock boom guide assembly in the travel position.

3-113. Heater Intake Housing

a. Cleaning and Inspection.

(1) Clean housing with approved cleaning solvent.

(2) Inspect housing for dents, broken welds, and rust. Tighten loose screws. Replace a badly damaged housing.



3. REMOVE HOUSING MOUNTING SCREW (4), LOCKWASHER (4), AND FLAT WASHER (4)

2. REMOVE LIGHTS (PARA 3-49)

1. REMOVE MOUNTING SCREW (6), LOCKWASHER (6) AND REMOVE BACK COVER

4. REMOVE HOUSING

5. REMOVE MOUNTING BOLT (2), NUTS (2) AND LOCKWASHER (2)

6. REMOVE YOKE (2)

7. REMOVE REFLECTOR MOUNTING SCREW (2)

8. REMOVE REFLECTOR

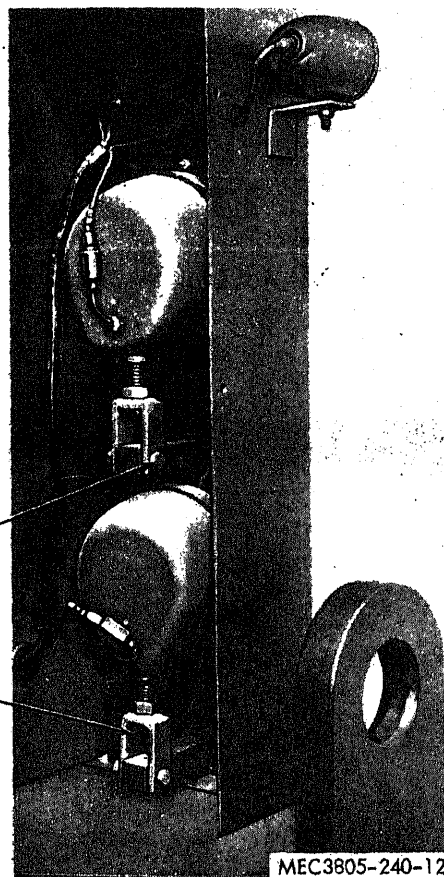


Figure 3-125. Headlight housing, removal and installation.

b. Removal. Refer to figure 3-131 and remove heater intake housing.

c. Installation. Refer to figure 3-131 and install heater intake housing.

3-114. Hood Assembly

a. Cleaning and Inspection.

(1) Clean hood assembly with approved cleaning solvent.

(2) Inspect hood assembly for dents, broken welds, damaged hardware; and rust. Tighten loose screws. Replace defective parts.

b. Removal. Refer to figure 3-132 and remove hood assembly.

c. Installation. Refer to figure 3-132 and install hood assembly.

3-115. Engine Access Panels

a. Cleaning and Inspection.

(1) Clean engine access panels with approved cleaning solvent.

(2) Inspect engine access panels for dents, broken welds, and rust. Tighten loose screws. Replace a badly damaged access panel.

b. Removal. Refer to figure 3-133 and remove engine access panels.

c. Installation. Refer to figure 3-133 and install engine access panels.

3-116. Front Panel

a. Cleaning and Inspection.

(1) Clean front panel with approved cleaning solvent.

(2) Inspect front panel for dents, breaks, and rust. Tighten loose screws. Replace a badly damaged panel.

b. Removal. Refer to figure 3-134 and remove front panel.

c. Installation. Refer to figure 3-134 and install front panel.

3-117. Rear Panel

a. Cleaning and Inspection.

(1) Clean rear panel with approved cleaning solvent.

(2) Inspect panel for dents, breaks, and rust. Tighten loose screws. Replace a badly damaged panel.

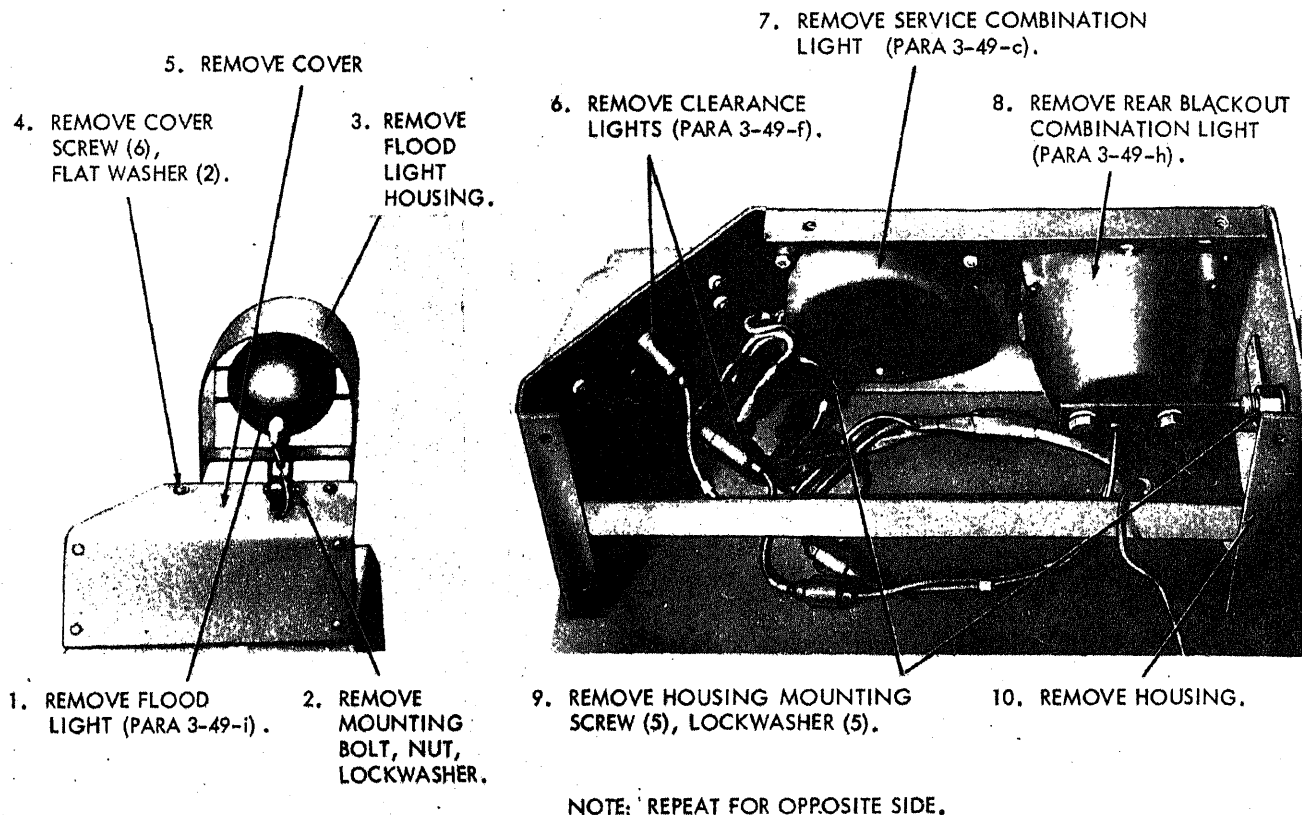


Figure 3-126. Rear light housing, removal and installation.

b. Removal. Refer to figure 3-135 and remove rear panel.

c. Installation. Refer to figure 3-135 and install rear panel.

3-118. Digging Control Panel

a. Cleaning and Inspection.

(1) Clean digging control panel with approved cleaning solvent.

(2) Inspect for dents, breaks, and rust. Tighten loose bolts. Replace a badly damaged panel.

b. Removal. Refer to figure 3-136 and remove digging control panel.

c. Installation. Refer to figure 3-136 and install digging control panel.

3-119. Tool Box

a. Cleaning and Inspection.

(1) Clean tool box with approved cleaning solvent.

(2) Inspect tool box for dents, broken welds, damaged hardware, and rust. Tighten loose screws. Replace a badly damaged tool box.

b. Removal. Refer to figure 3-137 and remove tool box.

c. Installation. Refer to figure 3-137 and install tool box.

3-120. Canvas and Frame Assembly

a. Cleaning and Inspection.

(1) Clean canvas and frame with approved cleaning solvent.

(2) Inspect canvas for punctures, wear, deterioration, damaged seams, windows, eyelets, and zippers. Replace defective canvas components.

(3) Inspect frame assembly for bends, broken welds, damaged joints, and rust. Tighten loose bolts. Replace badly damaged frame components.

b. Removal.

(1) Refer to figure 2-16 and remove canvas.

(2) Refer to figure 2-17 and remove frame assembly.

(3) Refer to figure 2-18 to store canvas and frame assembly.

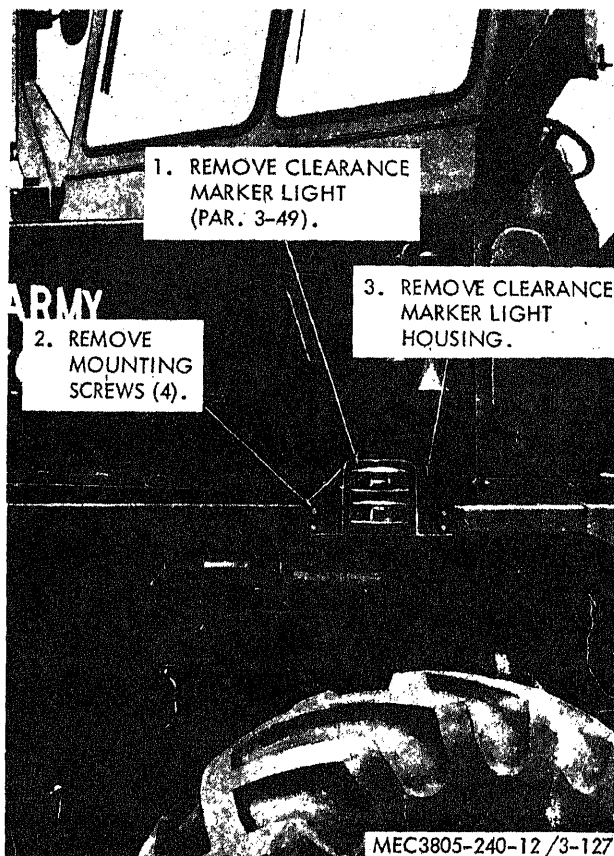


Figure 3-127. Clearance marker light housing, removal and installation.

c. Installation.

- (1) Refer to figure 2-17 and install frame assembly.
- (2) Refer to figure 2-16 and install canvas.

3-121. Windshield Assembly

a. Cleaning and Inspection.

- (1) Clean windshield assembly with approved cleaning solvent.
- (2) Inspect windshield assembly for dents, broken glass, damaged welds, and rust. Tighten loose screws. Replace damaged parts.

b. Removal.

- (1) Refer to figure 2-16 and remove canvas.
- (2) Refer to figure 2-17 and remove frame assembly.
- (3) Refer to figure 3-138 and remove windshield assembly.

c. Installation.

- (1) Refer to figure 3-138 and install windshield assembly.
- (2) Refer to figure 2-17 and install frame assembly.
- (3) Refer to figure 2-16 and install canvas.

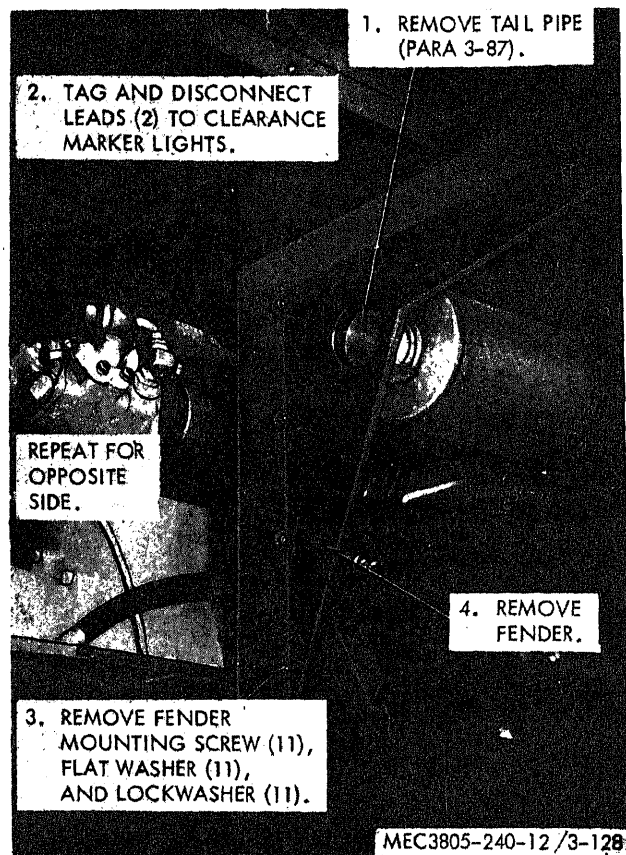


Figure 3-128. Front fender, removal and installation.

3-122. Top Access Cover

a. Cleaning and Inspection.

- (1) Clean top access cover with approved cleaning solvent.
- (2) Inspect top access cover for dents, breaks, and rust. Tighten loose screws. Replace a badly damaged cover.

b. Removal. Refer to figure 3-139 and remove access cover.

c. Installation. Refer to figure 3-139 and install top access cover.

3-123. Cab Assembly

a. Cleaning and Inspection.

- (1) Clean cab assembly with approved cleaning solvent.
- (2) Inspect cab assembly for dents, broken welds, mis-alignment, damaged hardware, and rust. Tighten loose screws. Replace a badly damaged cab.

b. Removal.

- (1) Refer to figures 2-16 and 2-17 and remove canvas and frame assembly.
- (2) Refer to figure 3-138 and remove windshield assembly.

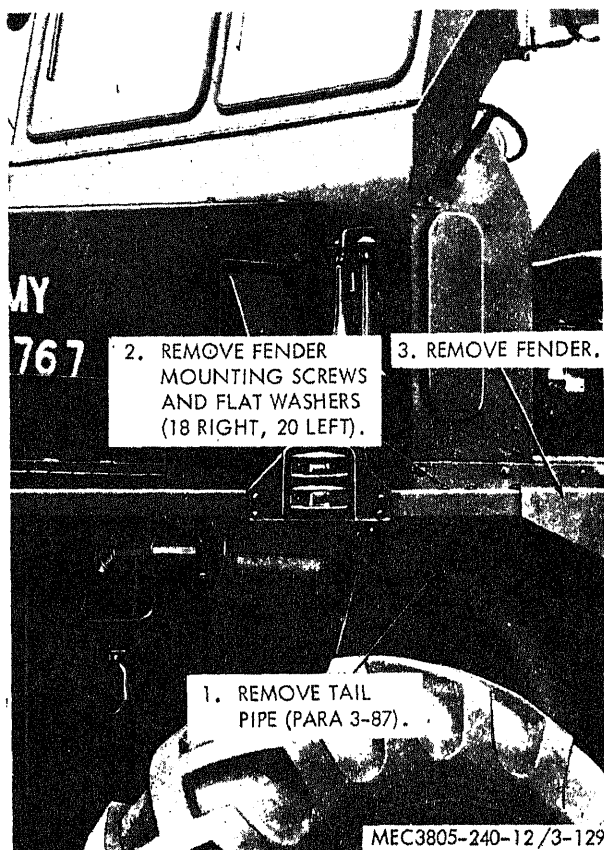


Figure 3-129. Center fender, removal and installation.

(3) Refer to paragraph 3-46 and remove instrument panel.

(4) Refer to figure 3-132 and remove hood assembly.

(5) Refer to figures 3-133 and 3-134 and remove engine access panel.

(6) Refer to figure 3-129 and remove left center fender.

(7) Refer to figure 3-128 and remove front fenders.

(8) Refer to figure 3-140 and remove cab assembly.

c. Installation. Refer to figure 3-140 and install cab assembly.

3-124. Battery Compartment

a. Cleaning and Inspection.

(1) Clean battery compartment with approved cleaning solvent.

(2) Inspect battery compartment for dents, cracks, broken welds, and corrosion. Tighten loose screws. Replace a badly damaged battery compartment.

b. Removal. Refer to figure 3-141 and remove battery compartment.

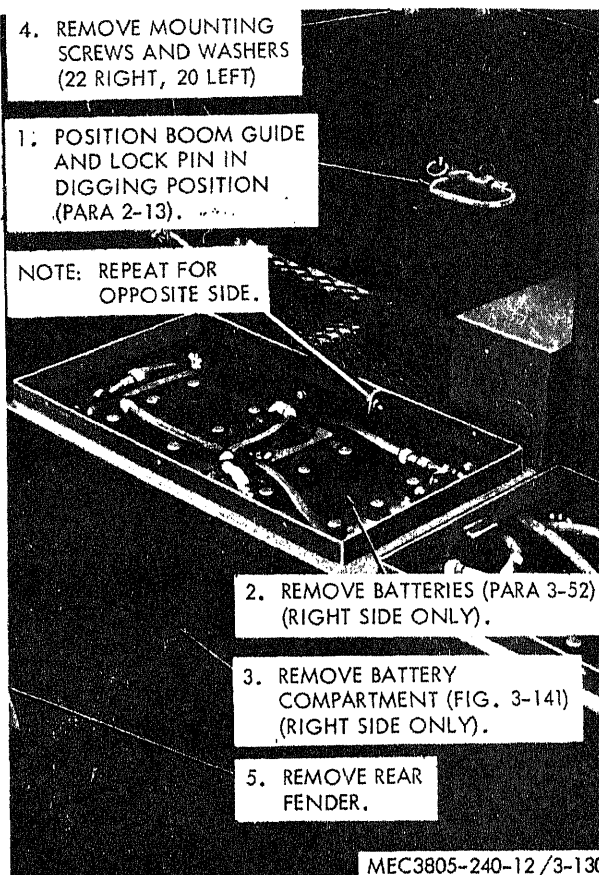


Figure 3-130. Rear fender, removal and installation.

c. Installation. Refer to figure 3-141 and install battery compartment.

3-125. Mirror Bracket

a. Cleaning and Inspection.

(1) Clean mirror bracket with approved cleaning solvent.

(2) Inspect mirror bracket for dents, broken welds, and rust. Tighten loose screws. Replace a damaged bracket.

b. Removal. Refer to figure 3-142 and remove mirror bracket.

c. Installation. Refer to figure 3-142 and install mirror bracket.

3-126. Seats

a. Cleaning and Inspection.

(1) Clean seats with approved cleaning solvent.

(2) Inspect seats for proper operation, worn or damaged cushions, bent frames, or other damage. Tighten loose mounting screws. Replace badly worn or damaged seats.

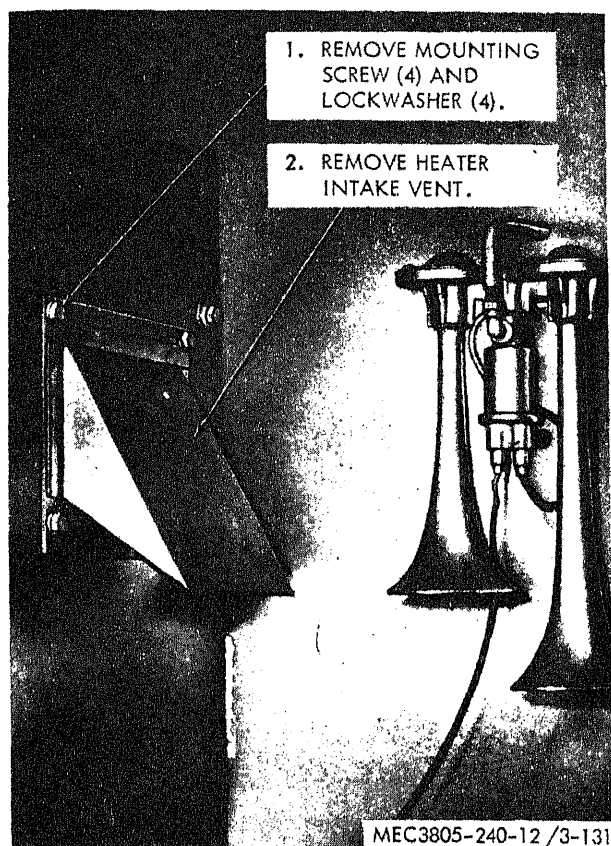


Figure 3-131. Heater intake housing, removal and installation.

b. Removal. Refer to figure 3-143 and remove seats.

c. Installation. Refer to figure 3-143 and install seats.

3-127. Floor Plates

a. Cleaning and Inspection.

(1) Clean floor plates with approved cleaning solvent.

(2) Inspect floor plates for dents, wear, and rust. Tighten loose screws. Replace badly damaged or worn floor plates.

b. Removal. Refer to figure 3-144 and remove floor plates.

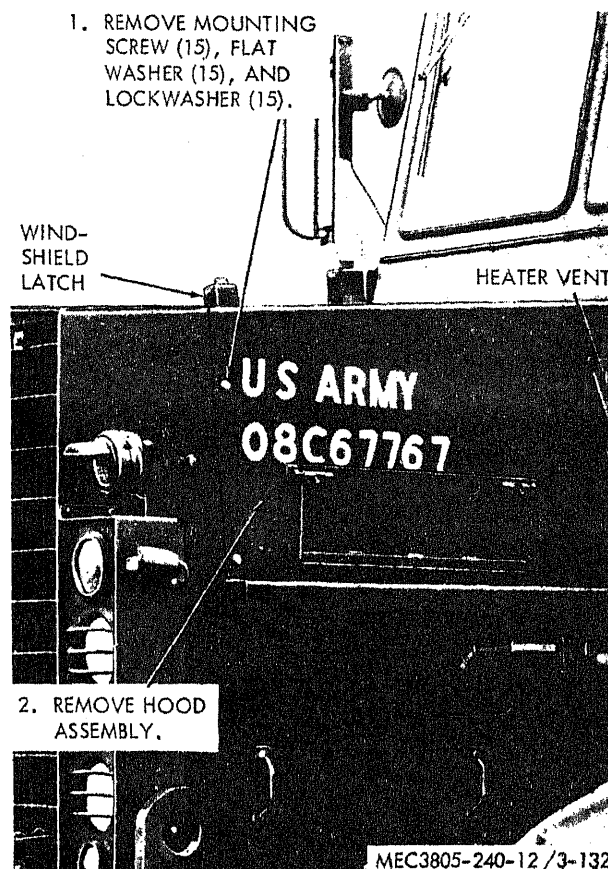


Figure 3-132. Hood assembly, removal and installation.

c. Installation. Refer to figure 3-144 and install floor plates.

3-128. Bottom Fender

a. Cleaning and Inspection.

(1) Clean bottom fender with approved cleaning solvent.

(2) Inspect bottom fender for dents, cracks, and rust. Tighten loose screws. Replace a badly damaged bottom fender.

b. Removal. Refer to figure 3-145 and remove bottom fender.

c. Installation. Refer to figure 3-145 and install bottom fender.

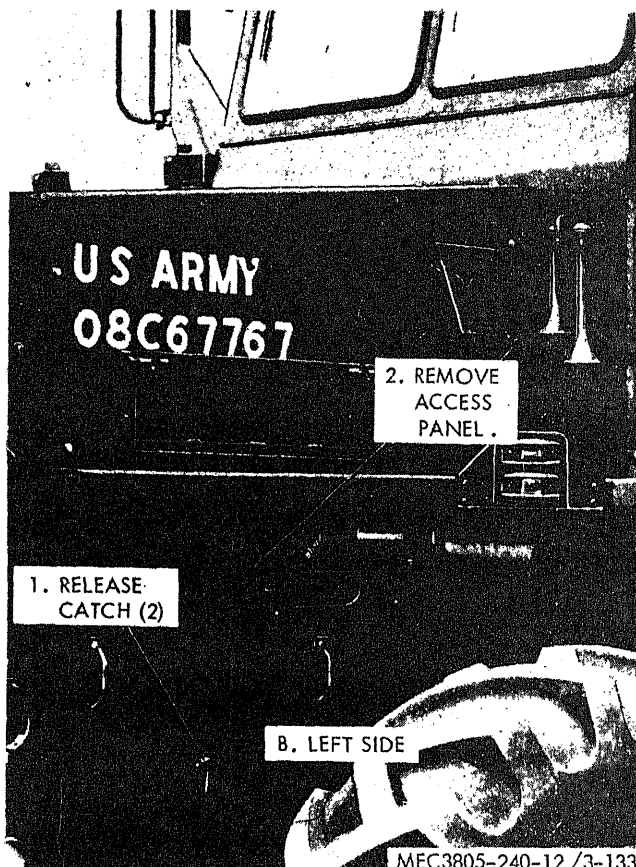
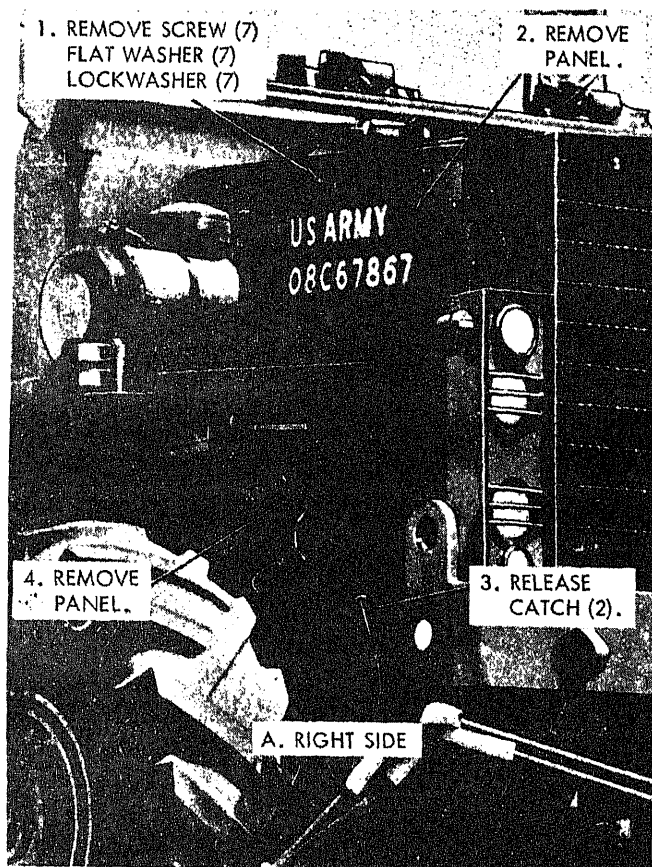


Figure 3-133. Engine access panel, removal and installation.

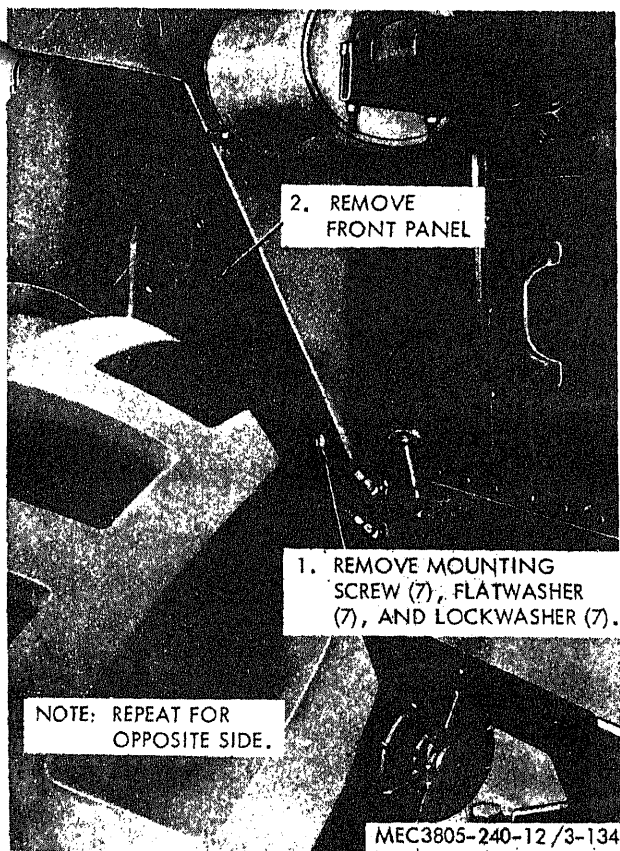


Figure 3-134. Front panel, removal and installation.

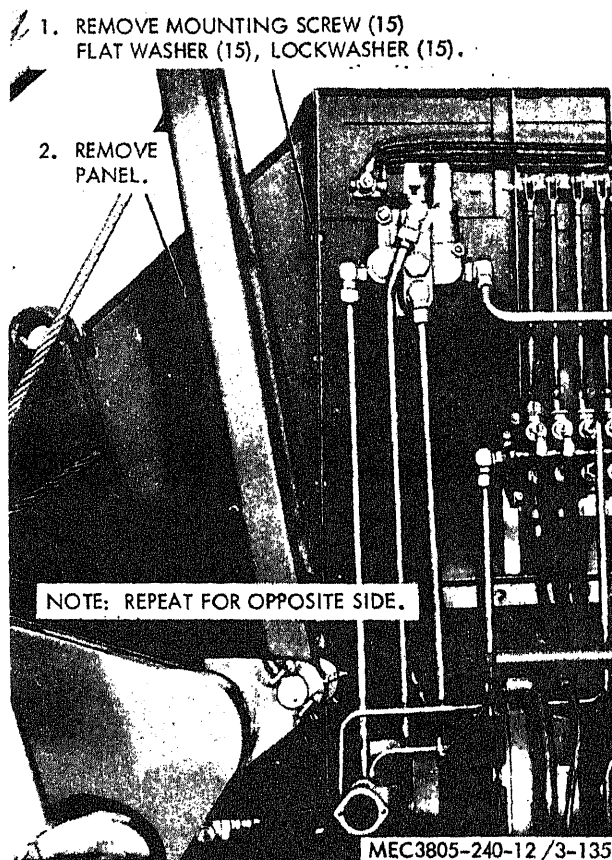


Figure 3-135. Rear panel, removal and installation.

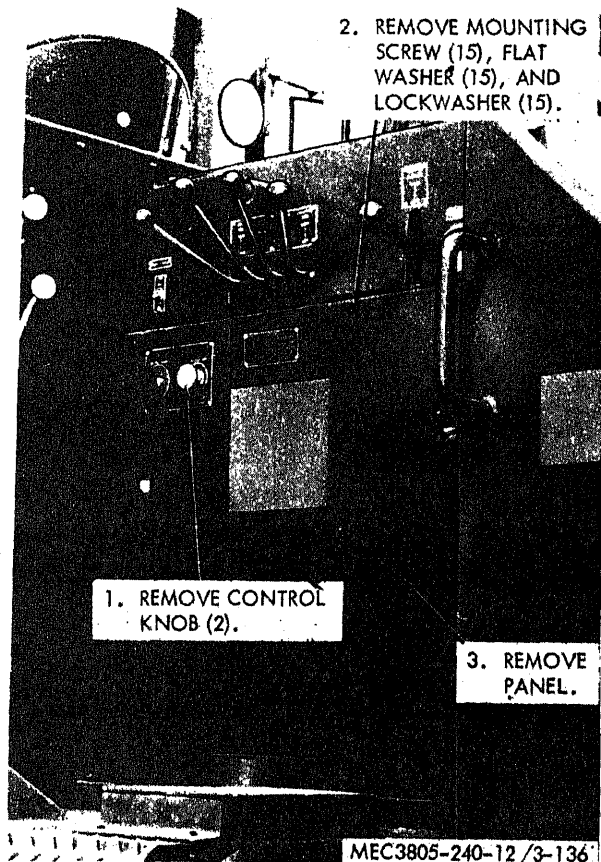


Figure 3-136. Digging station control panel, removal and installation.

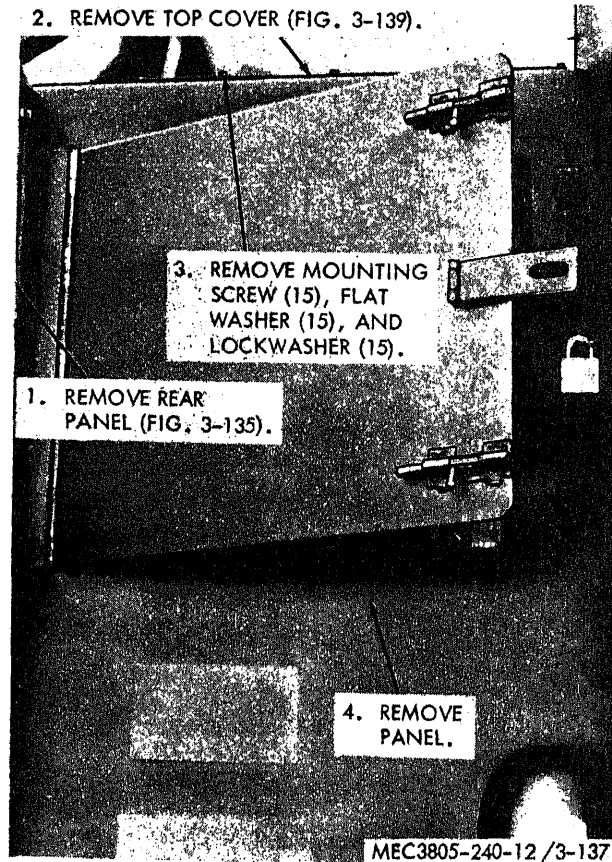


Figure 3-137. Tool box, removal and installation.

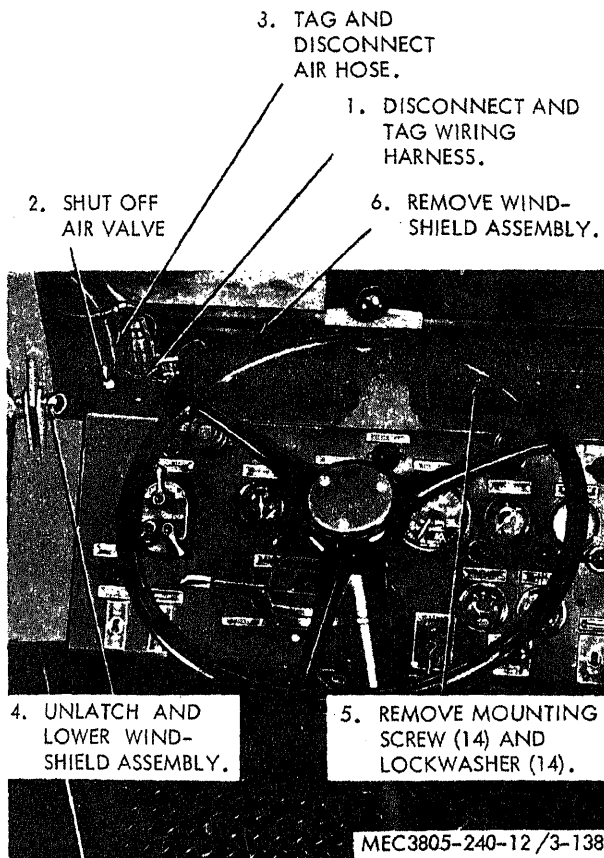


Figure 3-138. Windshield assembly, removal and installation.

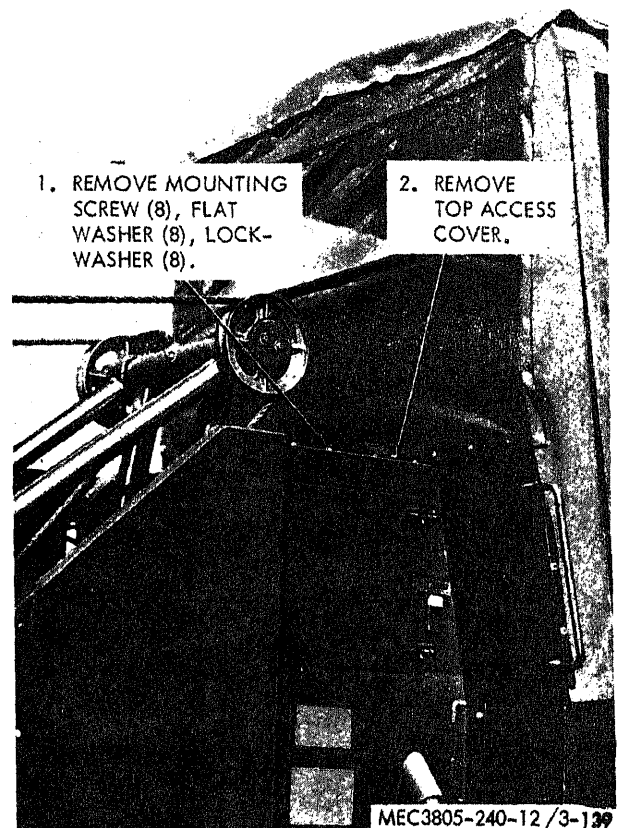


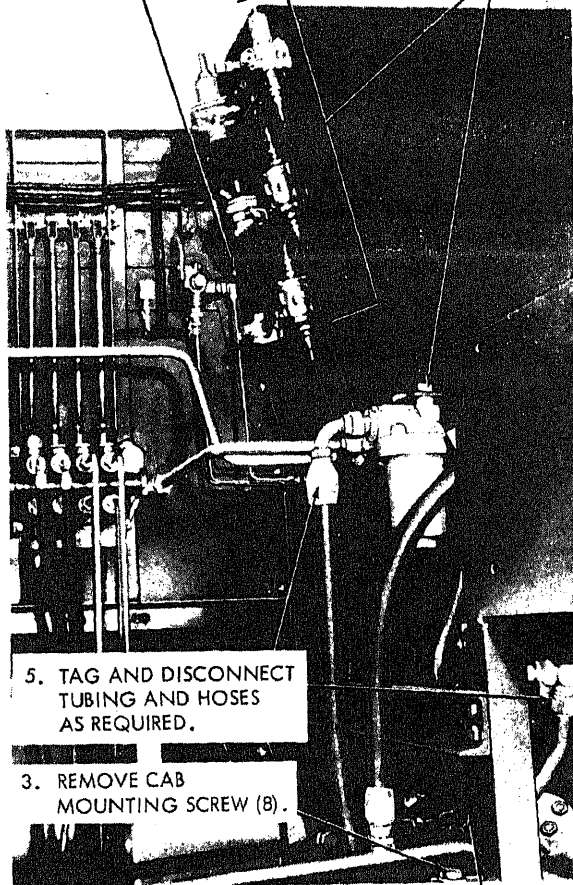
Figure 3-139. Top access cover, removal and installation.

2. REMOVE PANEL MOUNTING SCREW (10), FLAT WASHER (10), LOCKWASHER (10).

1. REMOVE COMPONENT MOUNTING SCREW (14) LOCKWASHER (14).

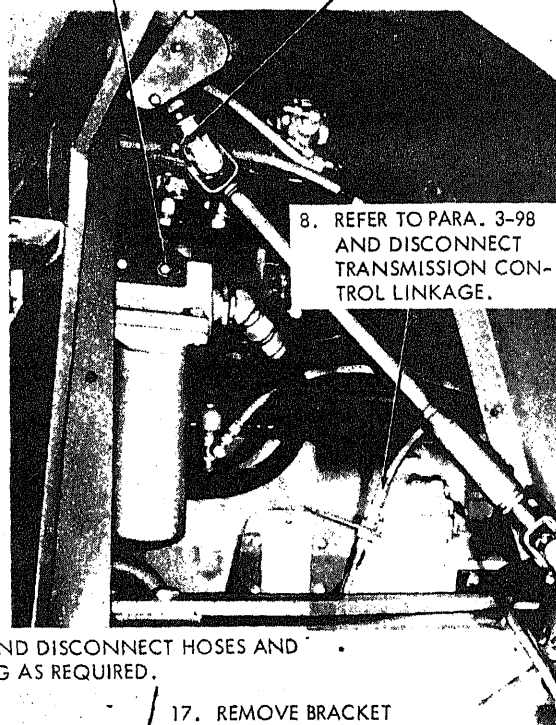
6. REMOVE MOUNTING SCREW (2) LOCKWASHER (2).

7. LOOSEN SCREW AND DISCONNECT STEERING SHAFT.



5. TAG AND DISCONNECT TUBING AND HOSES AS REQUIRED.

3. REMOVE CAB MOUNTING SCREW (8).



8. REFER TO PARA. 3-98 AND DISCONNECT TRANSMISSION CONTROL LINKAGE.

13. TAG AND DISCONNECT HOSES AND TUBING AS REQUIRED.

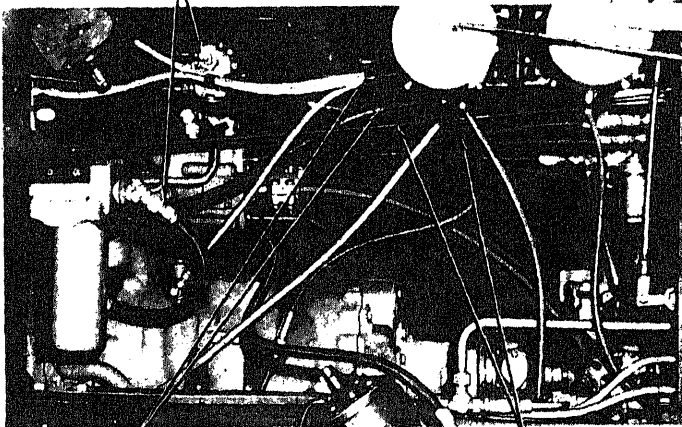
12. REMOVE BRACKET MOUNTING SCREW (6) LOCKWASHER (6).

17. REMOVE BRACKET MOUNTING SCREW (6) LOCKWASHER (6).

16. REMOVE HEATER DUCT MOUNTING SCREW (8) LOCKWASHER (8)

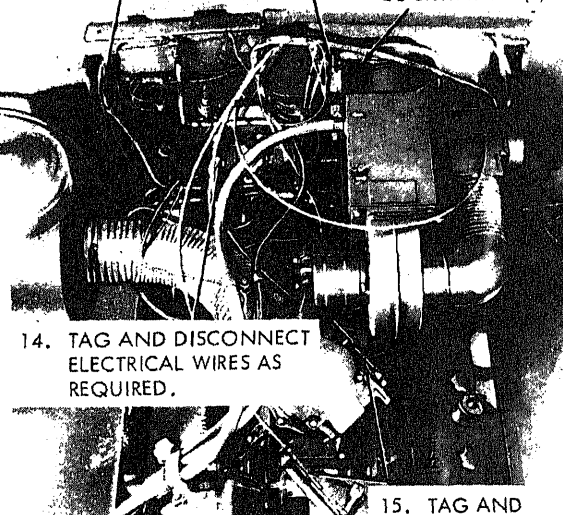
9. TAG AND DISCONNECT HOSES AND TUBING AS REQUIRED.

4. DISCONNECT CROWD DRIVE SHIFT LEVER LINKAGE.



10. REMOVE CLAMPS.

11. DISCONNECT PUMP LINKAGE (2).



14. TAG AND DISCONNECT ELECTRICAL WIRES AS REQUIRED.

18. USE SUITABLE LIFTING DEVICE AND REMOVE CAB ASSEMBLY.

15. TAG AND DISCONNECT MECHANICAL LINKAGES AS REQUIRED.

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Figure 3-140. Cab assembly, removal and installation.

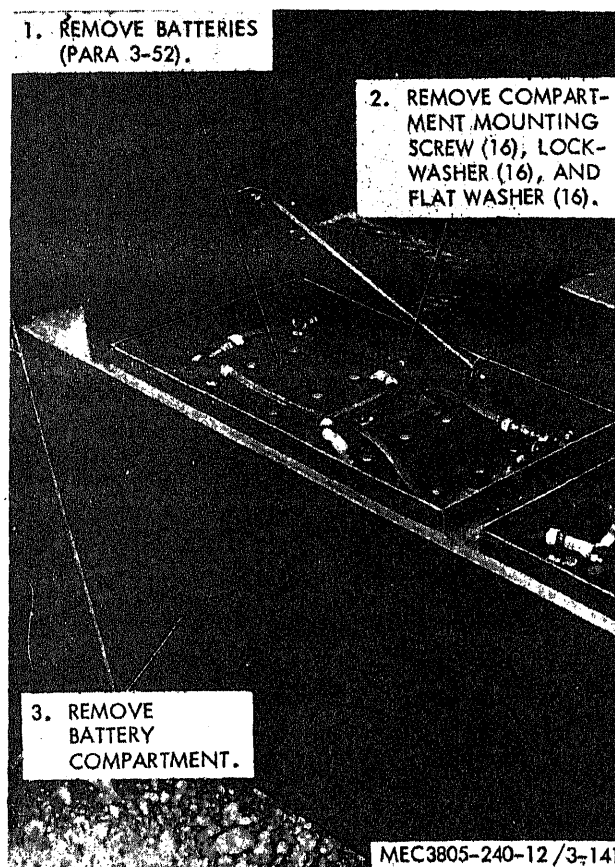


Figure 3-141. Battery compartment, removal and installation.

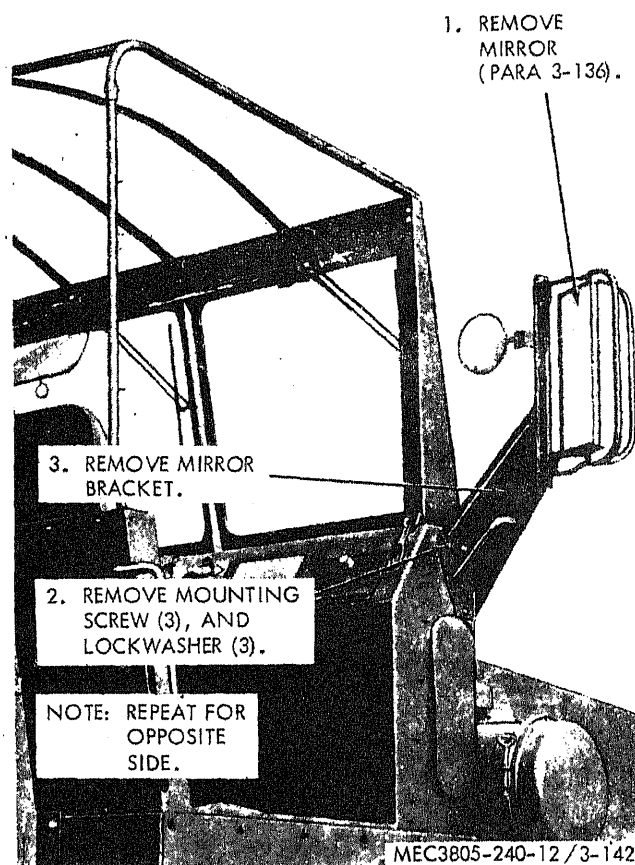


Figure 3-142. Mirror bracket, removal and installation.

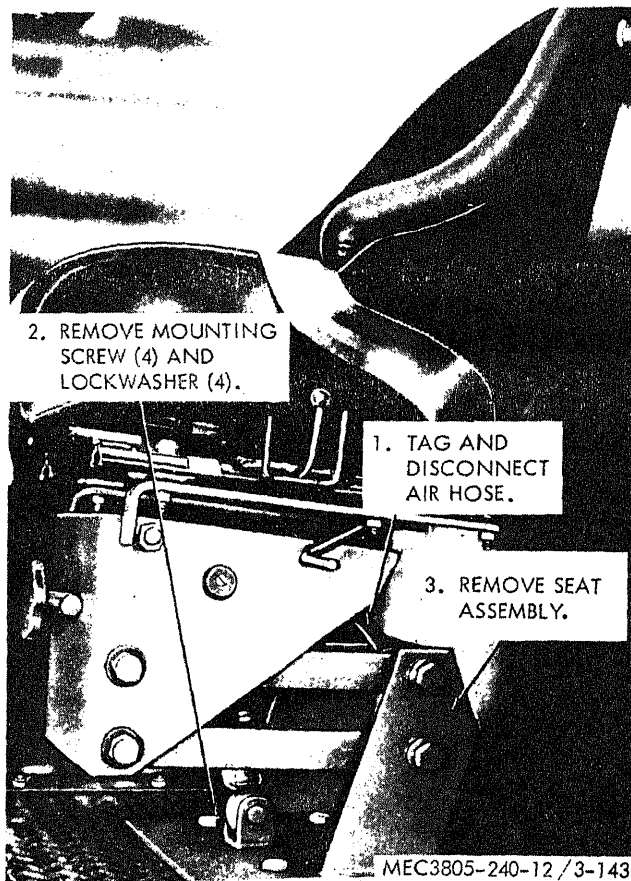
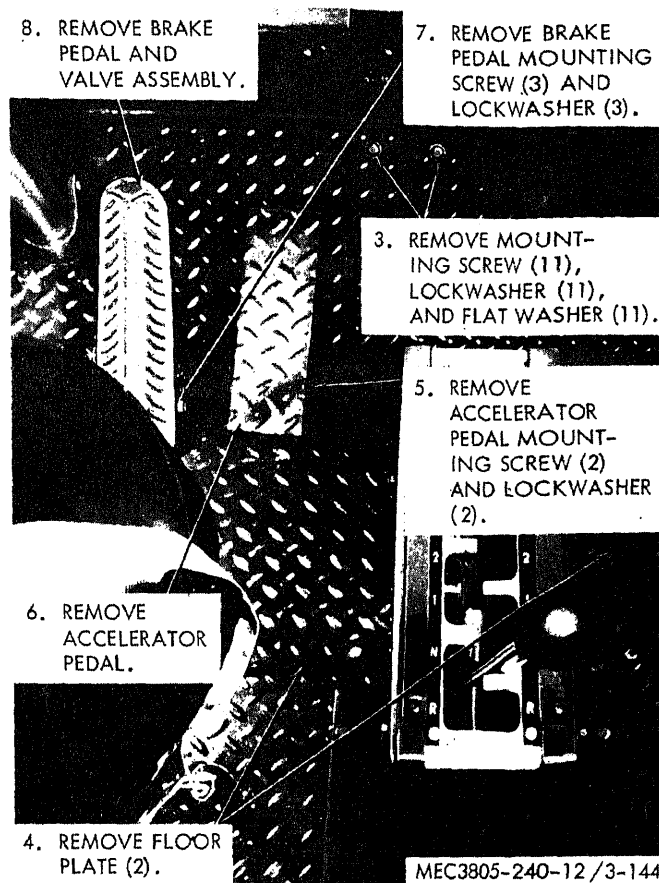
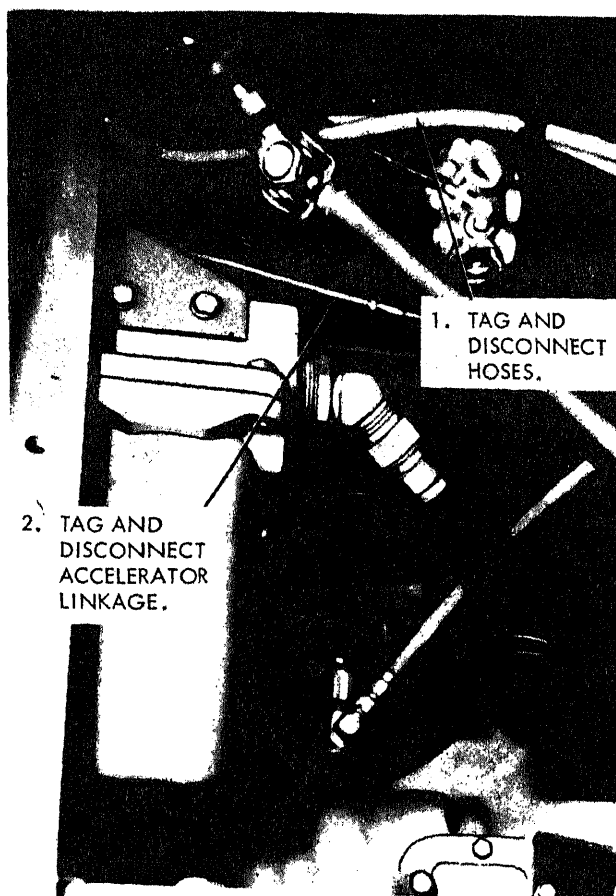


Figure 3-143. Seats, removal and installation.



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Figure 3-144. Floor plates, removal and installation.

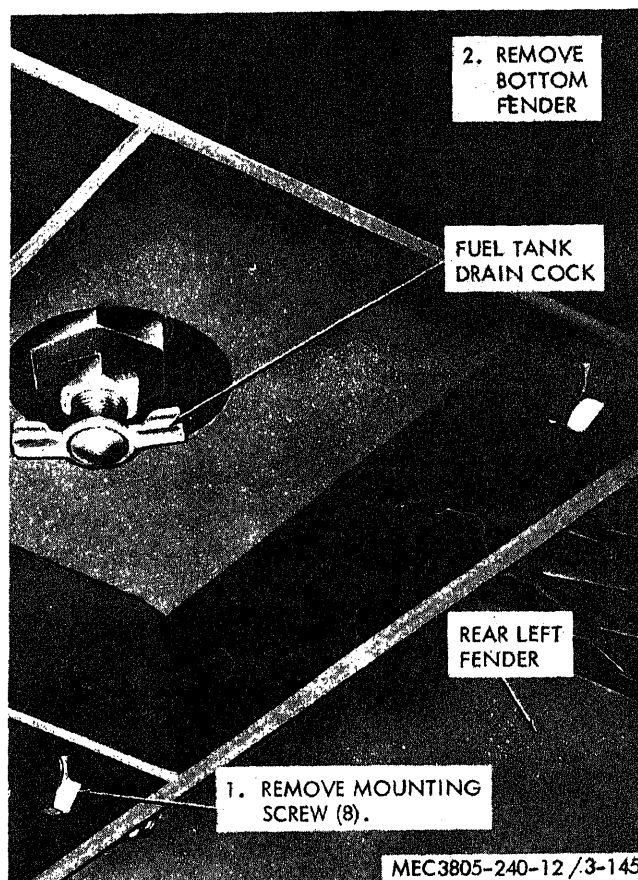


Figure 3-145. Bottom fender, removal and installation.

Section XV. WHEEL AND STEERING ASSEMBLIES

3-129. General

a. The four drive wheel assemblies consist of 18 x 25 hard rock lug tubeless tires mounted on 13 x 25 disc wheels.

b. The steering assembly consists of a steering wheel, two shafts and a gear box which transmit steering wheel movement to the hydraulic power steering unit. The power steering unit moves a pitman arm and draglink fastened to the front wheel steering arm to turn the wheels. If the hydraulic system fails, the ditcher can still be controlled by the steering wheel.

3-130. Wheel Assembly

a. Wheel.

(1) *Inspection.* Inspect the wheel assembly for damaged rim, lock ring, and for paint which has worn off or deteriorated. Tighten loose lug nuts (fig. 3-146).

(2) *Service.* Wash off all dirt, mud, or gear

(3) *Removal.* Refer to figure 3-146 and remove the wheel assembly.

(4) *Installation.* Refer to figure 3-146 and install the wheel assembly.

b. Tire.

(1) *Inspection.* Refer to TM-9-1870-1 and inspect the tire.

(2) *Service.* Refer to TM-9-1870-1 and service the tire.

(3) *Removal.* Refer to TM-9-1870-1 and remove the tire.

(4) *Installation.* Refer to TM-9-1870-1 and install the tire.

3-131. Steering Assembly

a. Gear Box Service.

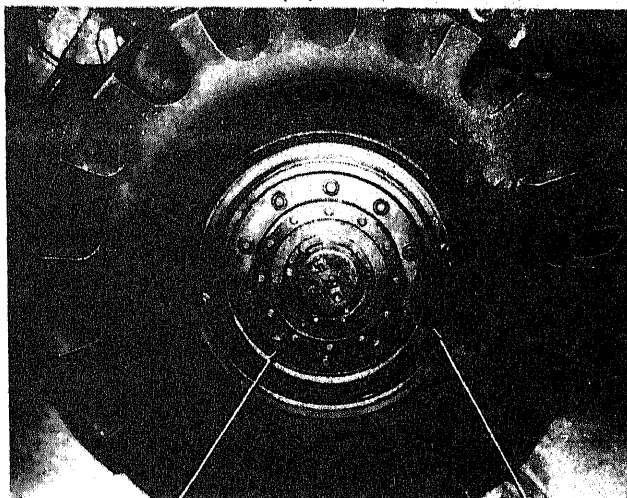
(1) Refer to figure 3-134 and remove the left front panel.

(2) Refer to figure 3-147 and service the steering gear box.

b. Hydraulic Pump Inspection.

(1) Refer to figure 3-144 and remove right-

1. BLOCK REMAINING WHEELS AND SET PARKING BRAKE
 2. WITH A SUITABLE JACK, RAISE UNIT UNTIL TIRE CLEARS GROUND
 3. BLOCK UP UNDER AXLE AND REMOVE JACK
 4. REMOVE NUTS (10) AND WHEEL ASSEMBLY
- NOTE: TORQUE NUTS (10) TO 450-500 FT. LBS.



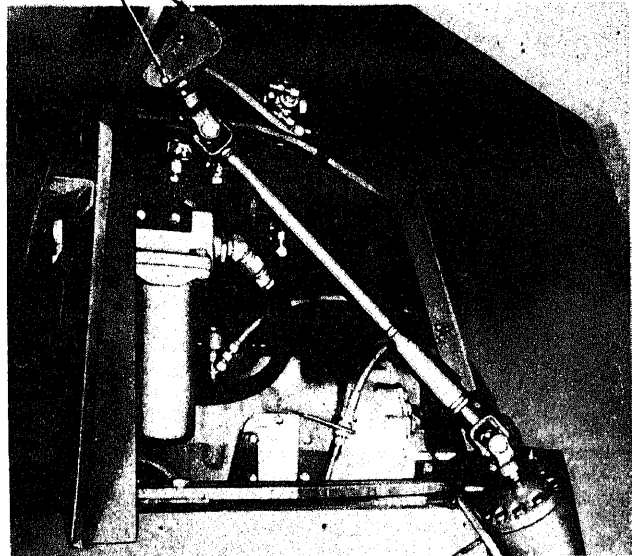
NUTS (10) LOCK RING
NOTE: REMOVE REMAINING WHEELS IN A SIMILAR MANNER

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Figure 3-146. Wheel assembly, removal and installation.

(2) Pump is located on right-hand side of power take-off. Inspect pump for leaks, tight fittings, and damage. Replace defective hoses and fittings.

1. REFER TO FIGURE 3-134 AND REMOVE LEFT FRONT PANEL
2. REMOVE SCREWS (3) AND REMOVE COVER PLATE



3. LUBRICATE IN ACCORDANCE WITH CURRENT LUBRICATION ORDER

MEC3805-240-12 /3-147

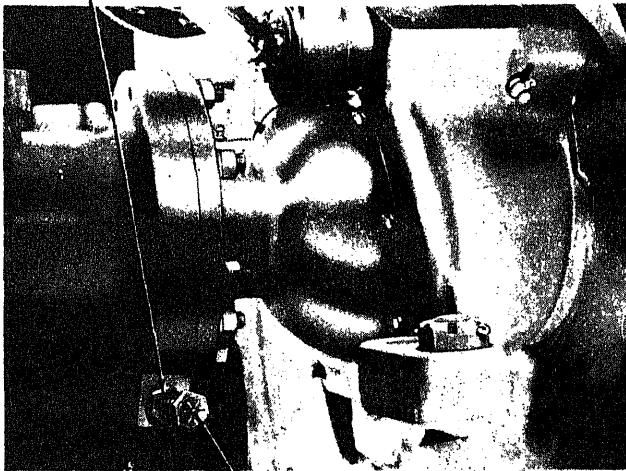
Figure 3-147. Steering gear box service.

c. *Tie-Rod Arm Stop Adjustment.* Refer to figure 3-148 and adjust the tie rod arm stop.

d. *Front Wheel Toe-In Adjustment.* Refer to figure 3-149 and adjust front wheel toe-in.

2. WITH ENGINE RUNNING, TURN STEERING WHEEL AS FAR AS IT WILL GO TO THE LEFT

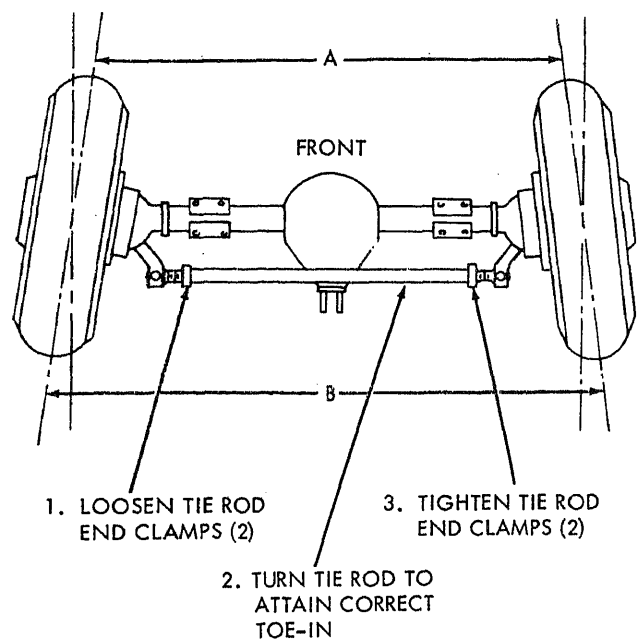
1. LOOSEN TIE ROD STOP JAM NUTS (2)



3. ADJUST STOP BOLT ON LEFT SIDE TO GIVE 1/16 INCH CLEARANCE BETWEEN THE BOLT HEAD AND THE TIE ROD ARM
4. TURN STEERING WHEEL AS FAR AS IT WILL GO TO THE RIGHT AND REPEAT ADJUSTMENT ON RIGHT SIDE OF AXLE
5. TIGHTEN JAM NUTS (2)

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Figure 3-148. Tie rod arm stop adjustment.



NOTE: CORRECT TOE-IN IS ATTAINED WHEN DIMENSION "A" IS 1/8 INCH LESS THAN DIMENSION "B".

NOTE: REPORT LOOSE TIE ROD ENDS TO DIRECT SUPPORT MAINTENANCE.

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Figure 3-149. Front wheel toe-in adjustment.

Section XVI. ACCESSORIES

3-132. General

a. The accessories described in this section are items which provide added safety, comfort, and convenience for the operator.

b. The ditcher is equipped with the following accessories:

- (1) Heater assembly.
- (2) Windshield wiper assembly.
- (3) Seat belts.
- (4) Mirrors.
- (5) Sun visors.

3-133. Heater Assembly

a. General.

(1) The heater is a hot water type with a 2-speed fan that circulates warm air to the cab and to the windshield defrosters.

(2) Controls are located on the dash board to the right of the instrument panel.

b. Inspection.

(1) Inspect motor, fan and heater housing for damage. Inspect for damaged or loose wires. Replace a damaged motor.

(2) Inspect heater and hoses for leaks. Replace defective parts.

c. Cleaning.

(1) Refer to figure 3-150 and remove motor and fan.

(2) Blow compressed air on core and tank assembly to remove dust and dirt.

d. Service. Refer to figure 3-151 and service the heater.

Caution: Drain heater core when draining ditcher radiator to protect from freezing.

e. Removal. Refer to figure 3-152 and remove heater.

f. Installation. Refer to figure 3-152 and install heater.

3-134. Windshield Wiper Assembly

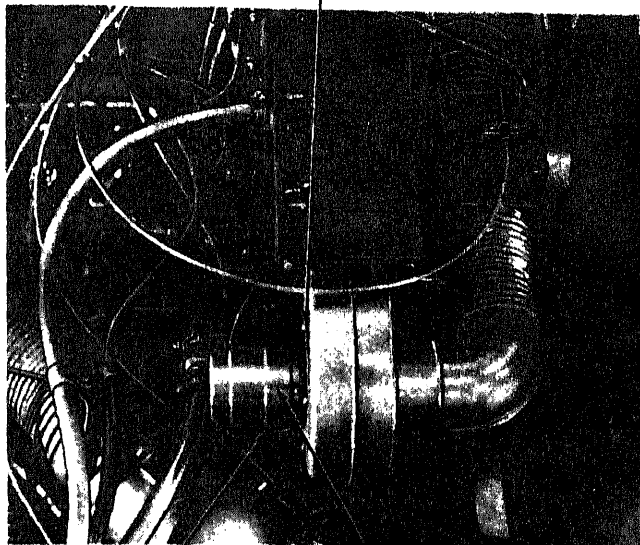
a. General.

(1) The windshield wipers are driven by two single-speed electric motors.

(2) The arms are double-bar pantograph type for maximum visibility.

1. REFER TO FIG. 3-133 AND REMOVE UPPER ENGINE ACCESS DOOR.

3. REMOVE BOLT (4)
WASHER (4).



2. TAG AND DISCONNECT
WIRE LEAD.

4. REMOVE MOTOR AND
BLOWER ASSEMBLY.

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Figure 3-150. Motor and fan assembly, removal and installation.

b. Inspection. Inspect motor, arms and blades for damage, wear, and loose wires. Replace defective parts.

c. Removal. Refer to figure 3-153 and remove wiper assembly.

d. Installation. Refer to figure 3-153 and install wiper assembly.

3-135. Seat Belts

a. Inspection. Inspect seat belts for wear and damage. Tighten loose mounting screws and nuts. Replace defective parts.

b. Removal. Refer to figure 3-154 and remove seat belts.

c. Installation. Refer to figure 3-154 and install seat belts.

3-136. Mirrors

a. Inspection. Inspect for loose, broken, or missing glass and other damage. Replace defective parts. Tighten loose mounting hardware.

b. Removal. Refer to figure 3-155 and remove mirrors.

c. Installation. Refer to figure 3-155 and install mirrors.

3-137. Sun Visors

a. Inspection. Inspect visors for wear and damage. Tighten loose mounting screws. Replace defective parts.

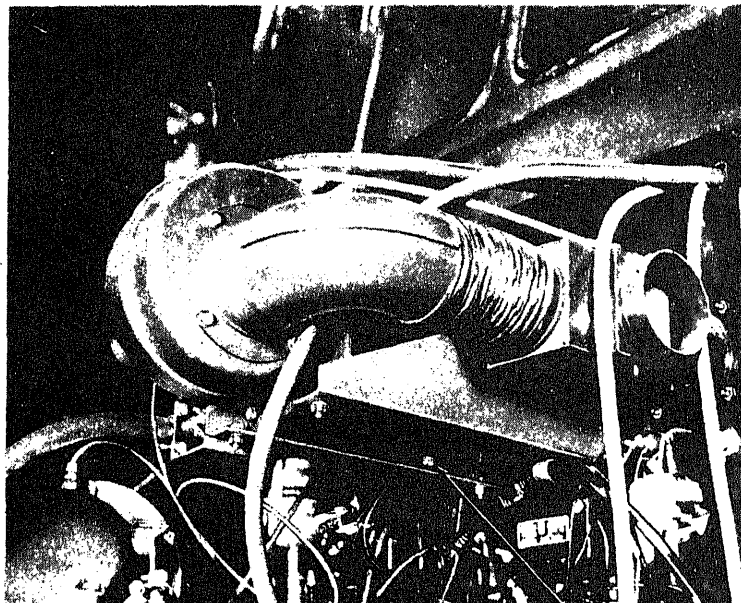
b. Removal. Refer to figure 3-156 and remove visors.

c. Installation. Refer to figure 3-156 and install visors.

FILLING:

1. OPEN AIR VENT.
2. RUN ENGINE, CLOSE VENT WHEN COOLANT OVERFLOWS.

HEATER AIR VENT



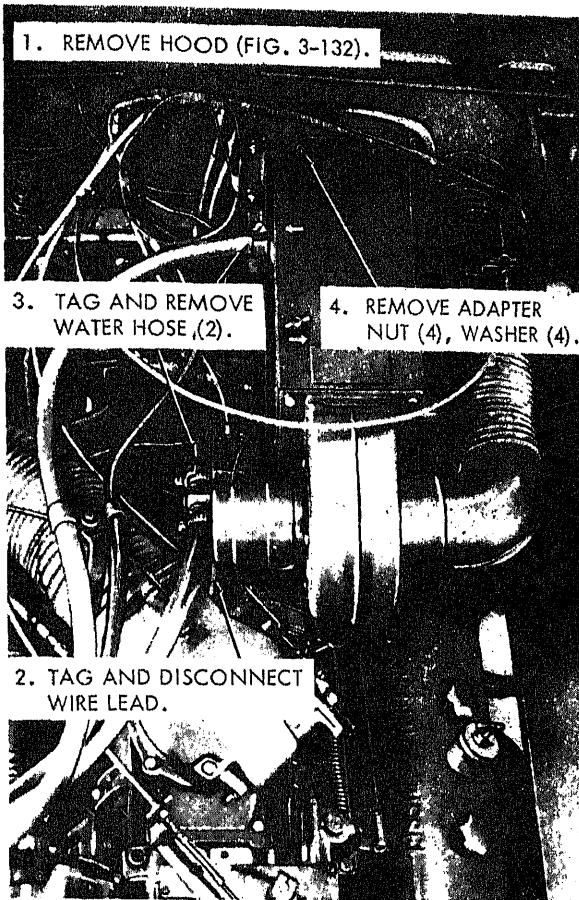
DRAINING:

1. OPEN AIR VENT.
2. REMOVE DRAIN PLUG AND DRAIN.
3. REPLACE DRAIN PLUG.
4. CLOSE AIR VENT.

DRAIN PLUG

MEC3805-240-12 / 3-151

Figure 3-151. Heater assembly service.



1. REMOVE HOOD (FIG. 3-132).

3. TAG AND REMOVE WATER HOSE (2).

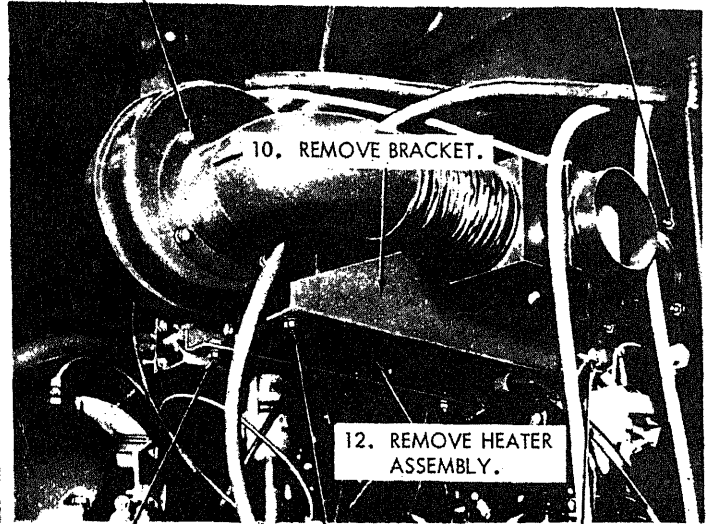
4. REMOVE ADAPTER NUT (4), WASHER (4).

2. TAG AND DISCONNECT WIRE LEAD.

7. LIFT OFF DIVERTER AND ELBOW ASSEMBLY AND LAY ON TOP OF ENGINE.

6. REMOVE BOLT (4) AND WASHER (4).

5. REMOVE BOLT (4), NUT (4) AND WASHER (4).



10. REMOVE BRACKET.

12. REMOVE HEATER ASSEMBLY.

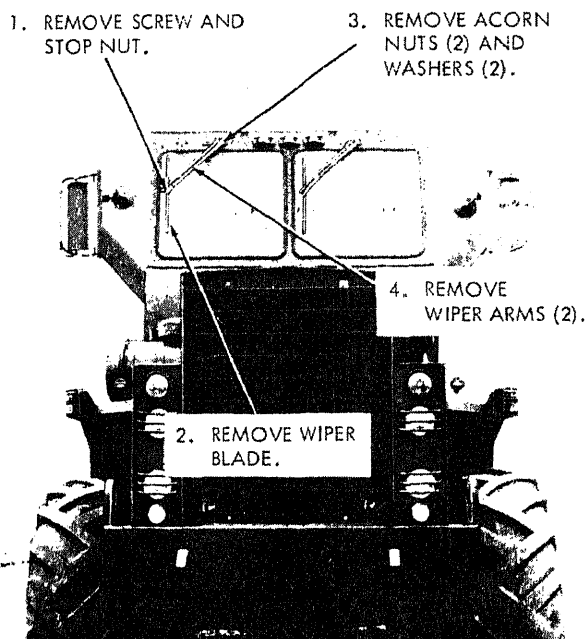
11. SUPPORT HEATER ASSEMBLY AND REMOVE NUT (2) WASHER (2) AND BOLT (2).

9. REMOVE NUT (2) WASHER (2) AND BOLT (2).

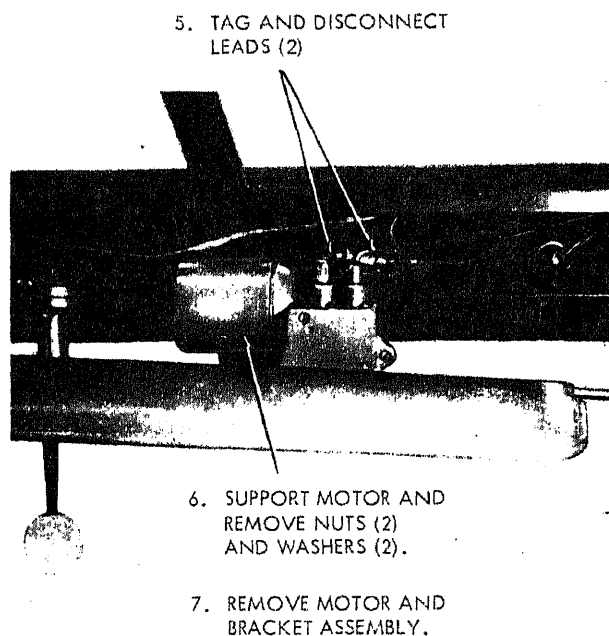
8. REMOVE BRACKET NUT (3) AND WASHER (3).

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Figure 3-152. Heater assembly, removal and installation.



REPEAT FOR OTHER WINDSHIELD WIPER.

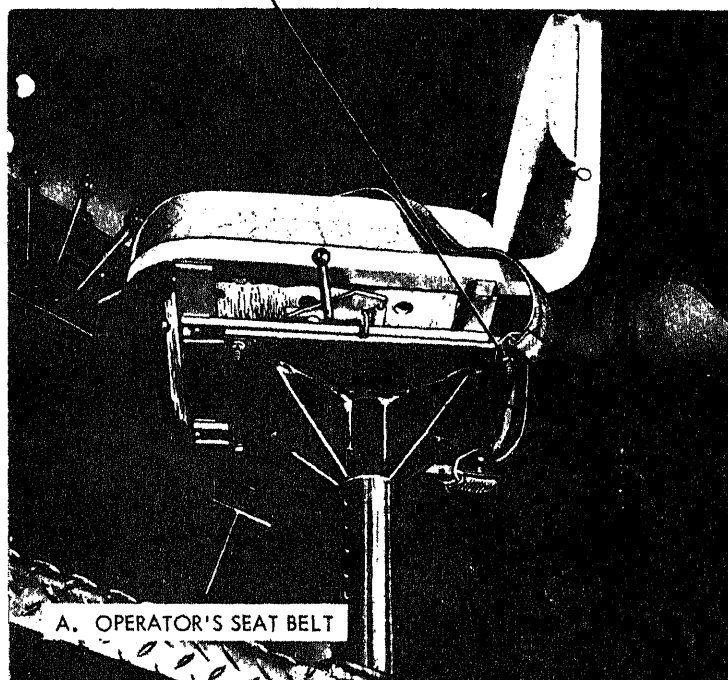


MEC3805-240-12 / 3-153

Figure 3-153. Windshield wiper and motor assembly removal and installation.

1. REMOVE STUD NUT (2)
AND WASHER (2).

2. REMOVE SEAT BELT (2).



4. REMOVE SEAT CUSHION.

5. REMOVE NUT (2)
WASHER (2) AND
DISHED WASHER (2)
FROM INSIDE OF
SEAT SHELL.

6. REMOVE BOLT (2)
WASHER (4) AND
BELT ASSEMBLY (2).

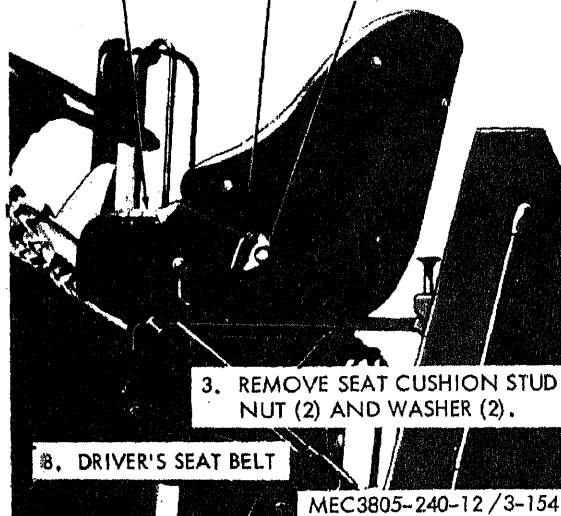


Figure 3-154. Seat belts, removal and installation.

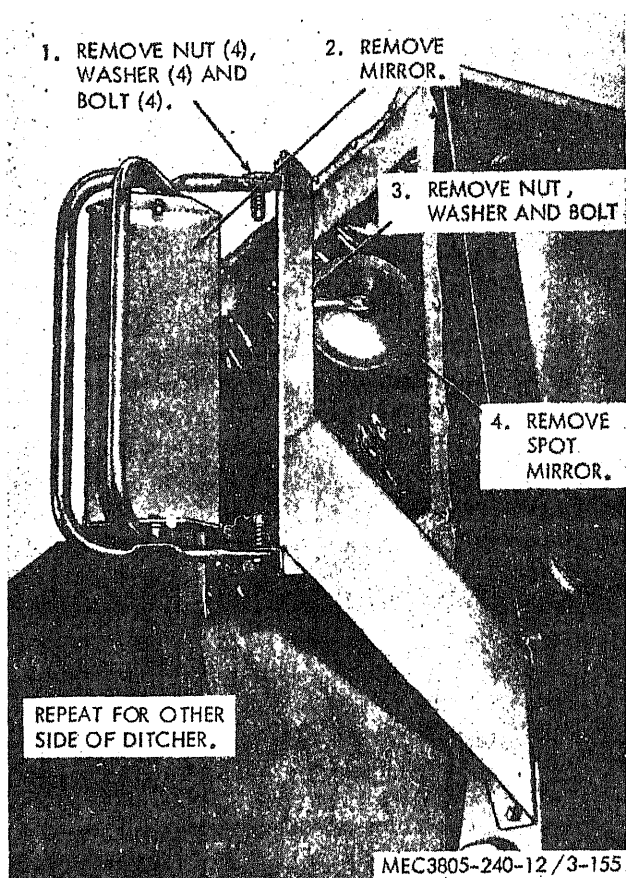


Figure 3-155. Mirrors, removal and installation.

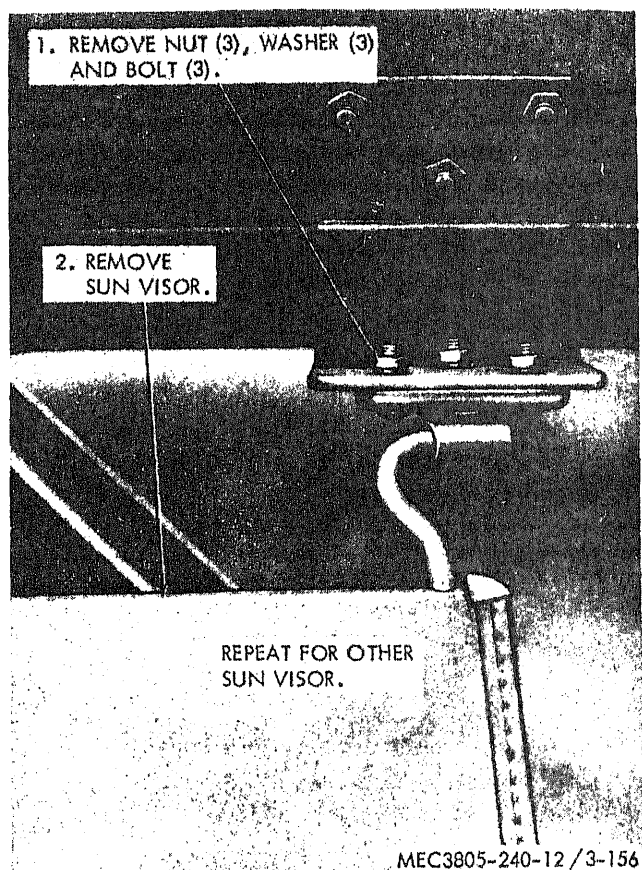


Figure 3-156. Sun visor, removal and installation.

Section XVII. TRANSFER CASE ASSEMBLY

3-138. General

a. The transfer case transmits power from the transmission/torque converter to the four ditcher drive wheels and the bucket line. The transfer case has its own lubricating system composed of a pump, manifold, and tubing to bearings, clutches, and shafts.

b. The bucket line is driven through a friction clutch on the transfer case. The clutch is actuated by one of the air-hydraulic power clusters. The amount of air pressure in the power cluster determines the force required to cause the clutch to slip and prevent damage to the bucket line or digging boom.

c. A similar clutch mechanism is used to lock-up the front axle drive shaft when operating in mud, sand, or snow. This equalizes the torque applied to front and rear wheels to help overcome loss of traction. The inter-axle lock-up can be operated from either the cab or the digging station.

d. During crowd drive the ditcher wheels are driven by a hydraulic motor mounted on the rear of the transfer case. The motor is driven by the crowd drive pump mounted on the transmission power take-off assembly. Crowding speed and direction (forward-reverse) are all controlled by the crowd drive pump and motor.

3-139. Transfer Case

a. Inspection.

(1) Inspect transfer case for leaks, damage, and secure mounting. Tighten loose screws and mounting bolts. Report damage to general support maintenance.

(2) Inspect lubricating oil pump, manifold, tubes and fittings for leaks and damage (fig. 3-157). Tighten fittings and replace damaged tubing as required. Report damage to pump or manifold to general support maintenance.

(3) Inspect crowd drive motor for leaks, damage, and secure mounting. Tighten mounting bolts and hose clamps. Report damage to general support maintenance.

place defective hose, tubes, or fittings as required. Report motor damage to direct support maintenance.

b. *Lubrication.* Lubricate in accordance with the current lubrication order.

c. *Service.* Refer to figure 3-158 and service the transfer case.

3-140. Crowd Drive Shift Lever and Linkage

a. *Inspection.*

(1) Inspect lever assembly in cab for proper

operation of lever and pawl detent assembly. Tighten loose mounting bolts and inspect all parts for damage. Report a badly damaged lever assembly to direct support maintenance.

(2) Inspect linkage to transfer case for bent or damaged parts. Repair or replace damaged parts as required.

b. *Lubrication.* Lubricate in accordance with the current lubrication order.

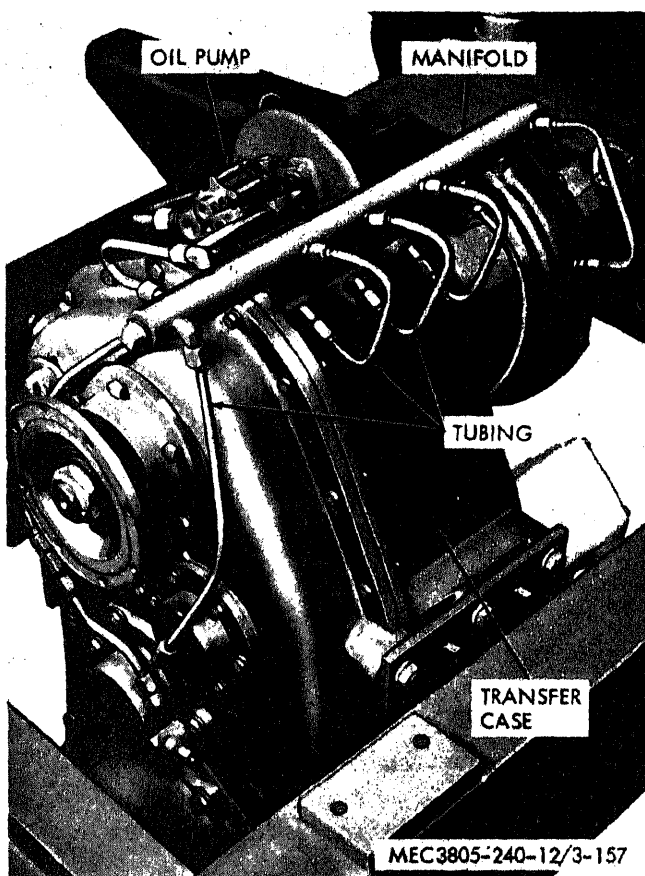


Figure 3-157. Transfer case lubrication components.

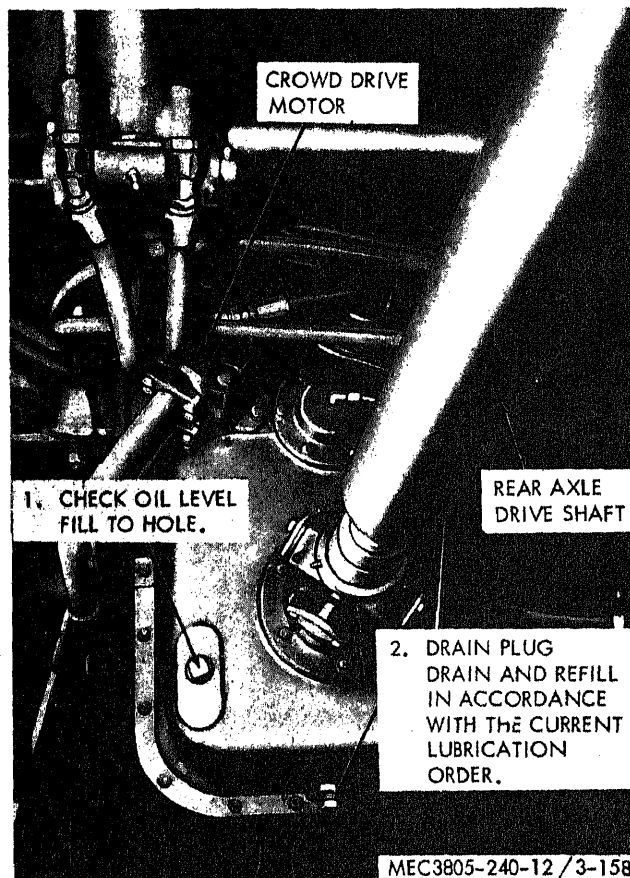


Figure 3-158. Transfer case service.

Section XVIII. GAGES (NON-ELECTRICAL)

3-141. General

The speedometer and tachometer gages are mounted on the instrument panel in the operator's cab. Both gages are mechanically operated by rotating cables. The cables are driven by worm gear adaptors attached to the transfer case and the engine.

3-142. Speedometer

a. *General.*

(1) The speedometer measures traveling speed in miles per hour.

(2) The speedometer drive cable adaptor is mounted on the front of the transfer case just above the front axle drive shaft clutch housing.

b. *Inspection.*

(1) Inspect the speedometer gage for proper operation, broken glass, secure mounting, and damage. Replace a defective gage.

(2) Inspect the drive cable ends for proper connections, wear, distortion, or damage. Inspect cable casing for abrasions, sharp bends, or damage. Replace a defective drive cable.

(3) Inspect the adaptor for damaged threads, housing, and leaks. Tighten loose mounting bolts and oil tube fittings.

c. Lubrication.

(1) The drive cable is a sealed unit and requires no lubrication.

(2) The adaptor is lubricated by an oil tube which is part of the transfer case lubrication system.

d. Removal.

(1) Remove the speedometer gage (para 3-46).

(2) Refer to figure 3-159 and remove the drive cable from the adaptor.

e. Installation.

(1) Refer to figure 3-159 and install the drive cable on the adaptor.

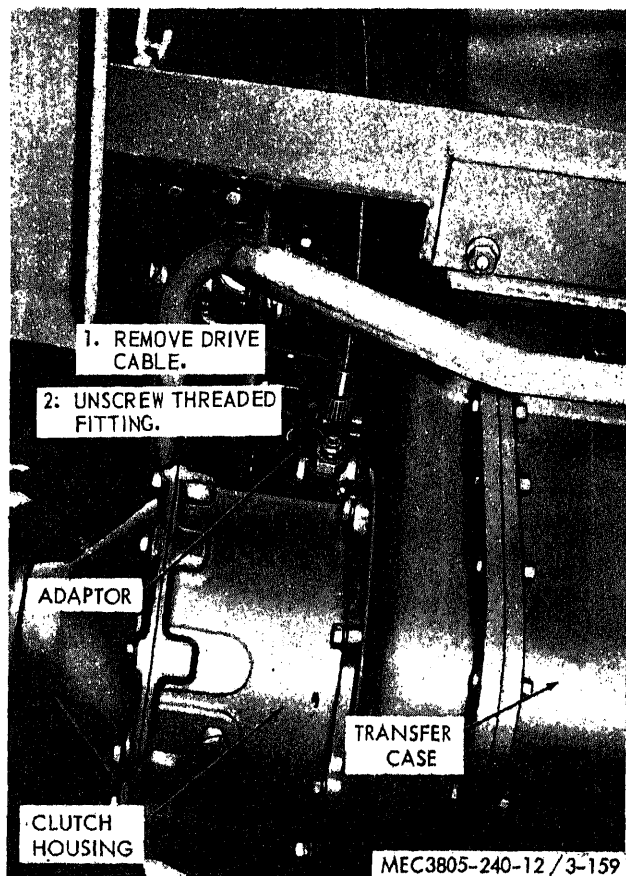


Figure 3-159. Speedometer drive cable, removal and installation.

(2) Install the speedometer gage (para 3-46).

Caution: Be sure keys on cable-ends line up with slots in the gage and the adaptor before tightening threaded fittings. Avoid sharp bends in cable during and after installation.

3-143. Tachometer

a. General.

(1) The tachometer measures engine speed in revolutions per minute.

(2) The tachometer drive cable adaptor is mounted on the rear of the engine blower housing.

b. Inspection.

(1) Inspect the tachometer gage for proper operation, broken glass, secure mounting, and damage. Replace a defective gage.

(2) Inspect the drive cable ends for proper connections, wear distortion, or damage. Inspect cable casing for abrasions, sharp bends, or damage. Replace a defective drive cable.

(3) Inspect the adaptor for damaged threads, housing, and grease fitting. Replace a damaged adaptor.

c. Lubrication.

(1) The drive cable is a sealed unit and requires no lubrication.

(2) Lubricate the tachometer drive cable adaptor in accordance with the current lubrication order.

d. Removal.

(1) Remove the tachometer gage (para 3-46).

(2) Refer to figure 3-160 and remove the drive cable and the adaptor.

e. Installation.

(1) Refer to figure 3-160 and install the drive cable and the adaptor.

(2) Install the tachometer gage (para 3-46).

Caution: Be sure keys on cable-ends line up with slots in the gage and the adaptor before tightening threaded fittings. Avoid sharp bends in cable during and after installation.



Figure 3-160. Tachometer drive cable and adaptor, removal and installation.

CHAPTER 4

DEMOLITION OF MATERIAL TO PREVENT ENEMY USE

Section I. GENERAL

4-1. Scope

When capture or abandonment of the ditching machine is imminent, the responsible unit commander makes the decision either to destroy the unit or to render it inoperative. Based on this

decision, orders are issued which cover the desired extent of destruction. Whatever method of demolition is employed, it is essential to destroy the same vital parts of all ditching machines and all corresponding repair parts.

Section II. DEMOLITION TO RENDER DITCHING MACHINE INOPERATIVE

4-2. Demolition by Mechanical Means

a. Use sledge hammers, crowbars, picks, axes, or any other heavy tools which may be available, together with tools normally included with the ditching machine.

b. *Destroy the following:*

(1) The engine starter, alternator and manifold.

(2) The engine fuel injection system and water pump.

Note. The above method is the minimum requirement for this method of destruction.

(3) The transmission and transfer case.

(4) The instrument control panel.

(5) The tires.

(6) The engine cylinder heads and crankcase.

(7) The steering wheel, levers, and controls.

4-3. Demolition by Misuse

a. Drain the engine crankcase and radiator. Start the engine, allow it to run until failure occurs.

b. Throw sand or other abrasive into the crankcase, hydraulic reservoirs, and fuel oil tank.

c. Drive the unit over a bank or into a solid object.

4-4. Demolition by Explosives

a. Place as many of the following charges (fig. 4-1) as the situation permits and detonate them simultaneously with a detonating cord and a suit-

(1) Two 1/2-pound charges between air compressor and block.

(2) Two 1/2-pound charges on each right-angle drive sprocket.

(3) Two 1/2-pound charges between each rocker arm cover and the blower.

Note. The above steps are the minimum requirements for this method.

(4) One 1/2-pound charge on the starter.

(5) Four 1/2-pound charges under both the transmission and transfer case.

b. *Weapons Fire.* Fire on the ditching machine with the heaviest practical weapons available.

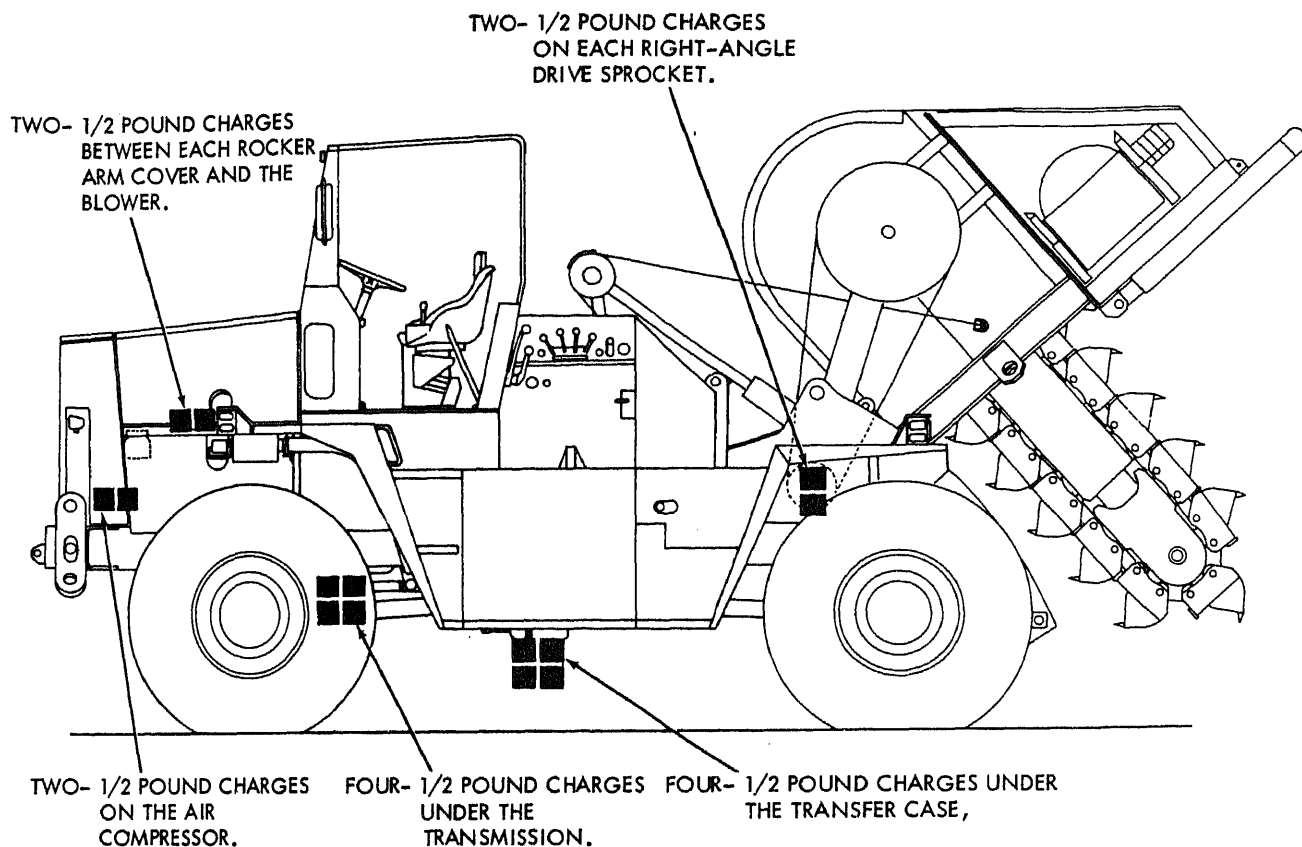
4-5. Other Demolition Methods

a. *General.* If the situation prohibits employing either of the preferred methods, use the following, either singly or in combination.

b. *Demolition by Scattering and Concealment.* Remove all easily accessible vital parts such as the starter, generator, and fuel injectors. Scatter these parts through dense foliage, bury them in dirt or sand, or throw them in a lake, stream, well, or other body of water.

c. *Demolition by Burning.* Pack rags, clothing, or canvas under and around the engine. Saturate this packing with gasoline, oil, or diesel fuel, and ignite.

d. *Demolition by Submersion.* Drive the unit into a body of water to provide some water damage and concealment. Salt water will do the



MEC3805-240-12/4-1

Figure 4-1. Placement of demolition charges.

4-6. Training

a. All operators should receive thorough training in the destruction of the ditching machine. Refer to FM 5-25.

b. Simulated destruction, using all of the methods listed above, should be included in the operator training program. It must be empha-

sized in training that demolition operations are usually necessitated by critical situations when time available for carrying out destruction is limited. For this reason, it is necessary that the operators be thoroughly familiar with all methods of destruction of equipment, and be able to carry out demolition instructions without reference to this or any other manual.

APPENDIX A

REFERENCES

A-1. Fire Protection

TB 5-4200-200-10 Hand Portable Fire Extinguishers Approved for Army Users.

A-2. Lubrication

C9100-IL Fuels, Lubricants, Oils and Waxes
LO 5-3805-240-12 Lubrication Order.

A-3. Painting

TM 9-213 Painting Instructions for Field Use.

A-4. Maintenance

TM 9-1870-1 Care and Maintenance of Pneumatic Tires
TB ORD 651 Use of Antifreeze Solutions and Cleaning Compounds in Engine Cooling Systems
TM 38-750 Army Equipment Record Procedures
TM 5-3805-240-35 Direct and General Support and Depot Maintenance Manual
TM 5-3805-240-35P Direct and General Support and Depot Repair Parts
TM 9-6140-200-15 Operation and Organizational Field and Depot Maintenance Storage Batteries, Lead-Acid Type

A-5. Shipment and Storage

TB 740-93-2 Preservation of USAMEC Mechanical Equipment for Shipment and Storage
TM 740-90-1 Administrative Storage of Equipment

APPENDIX B

BASIC ISSUE ITEMS LIST

Section I. INTRODUCTION

B-1. Scope

This appendix lists items which accompany the ditcher or are required for installation, operation, or operator's maintenance.

B-2. General

This Basic Issue Items List is divided into the following sections:

a. Basic Issue Items—Section II. A list of items which accompany the ditcher or are required for the installation, operation, or operator's maintenance.

b. Maintenance and Operating Supplies—Section III. A listing of maintenance and operating supplies required for initial operation.

B-3. Explanation of Columns

The following provides an explanation of columns in the tabular list of Basic Issue Items, Section II.

a. Source, Maintenance, and Recoverability Codes (SMR), Column (1):

(1) Source Code, indicates the selection status and source for the listed item. Source codes are:

| Code | Explanation |
|------|--|
| P | Applied to repair parts which are stocked in or supplied from GSA/DSA or Army supply system, and authorized for use at indicated maintenance categories. |
| M | Applied to repair parts which are not procured or stocked but are to be manufactured at indicated maintenance categories. |
| A | Applied to assemblies which are not procured or stocked as such, but made up of two or more units, each of which carry individual stock numbers and descriptions and are procured and stocked and can be assembled by units at indicated maintenance categories. |
| X | Applied to parts and assemblies which are not procured or stocked, the mortality of which is normally below that of the applicable end item, and the failure of which should result in retirement of the end item from the supply system. |
| X1 | Applied to repair parts which are not procured or stocked, the requirements for which will be supplied by the next |

| Code | Explanation |
|------|--|
| X2 | Applied to repair parts which are not stocked. The indicated maintenance category requiring such repair parts will attempt to obtain them through cannibalization; if not obtainable through cannibalization, such repair parts will be requisitioned with supporting justification through normal supply channels. |
| C | Applied to repair parts authorized for local procurements. If not obtainable from local procurement, such repair parts will be requisitioned through normal supply channels with a supporting statement of nonavailability from local procurement. |
| G | Applied to major assemblies that are procured with PEMA (Procurement Equipment Missile Army) funds for initial issue only to be used as exchange assemblies at DSU and GSU level or returned to depot supply level. <i>Note.</i> Source code and level of maintenance are not shown on common hardware items known to be readily available in Army supply channels and through local procurement. |
| (2) | Maintenance Code, indicates the lowest category of maintenance authorized to install the listed item. The maintenance level code is: |

| Code | Explanation |
|------|----------------------------|
| C -- | Operator/crew |
| O -- | Organizational maintenance |

(3) Recoverability Code, indicates whether unserviceable items should be returned for recovery or salvage. Items not coded are expendable. Recoverability codes are:

| Code | Explanation |
|------|--|
| R | Applied to repair parts and assemblies which are economically repairable at DSU and GSU activities and are normally furnished by supply on an exchange basis. |
| T | Applied to high dollar value recoverable repair parts which are subject to special handling and are issued on exchange basis. Such repair parts are normally repaired or overhauled at depot maintenance activities. |
| U | Applied to repair parts specifically selected for salvage by reclamation units because of precious metal content, critical materials, high dollar value, reusable casings and |

b. *Federal Stock Number, Column (2).* This column indicates the Federal stock number for the item.

c. *Description, Column (3).* This column indicates the Federal item name and any additional description of the item required. A part number or other reference number is followed by the applicable five-digit Federal supply code for manufacturers in parentheses. Repair parts quantities included in kits, sets, and assemblies are shown in front of the repair part name.

d. *Unit of Issue, Column (4).* This column indicates the unit used as a basis for issue, e.g., ea, pr, ft, yd, etc.

e. *Quantity Incorporated in Unit Pack, Column (5).* This column indicates the actual quantity contained in the unit pack.

f. *Quantity Incorporated in Unit, Column (6).* This column indicates the quantity of the item used in the functional group.

g. *Quantity Furnished With Equipment, Column (7).* This column indicates the quantity of an item furnished with the equipment.

h. *Quantity Authorized, Column (8).* This column indicates the quantity of an item authorized the operator/crew to have on hand or to obtain as required. As required items are indicated with an asterisk.

i. *Illustration, Column (9).* This column is divided as follows:

(1) *Figure number, column (9)(a).* Indicates the figure number of the illustration in which the item is shown.

(2) *Item number, column (9)(b).* Indicates the callout number used to reference the item in the illustration.

B-4. Explanation of Columns in the Tabular List of Maintenance and Operating Supplies—Section III

a. *Component Application, Column (1).* This column identifies the component application of each maintenance or operating supply item.

b. *Federal Stock Number, Column (2).* This column indicates the Federal stock number for the item and will be used for requisitioning purposes.

c. *Description, Column (3).* This column indicates the item and brief description.

d. *Quantity Required for Initial Operation, Column (4).* This column indicates the quantity of each maintenance or operating supply item required for initial operation of the equipment.

e. *Quantity Required for 8 Hours Operation, Column (5).* This column indicates the estimated quantities required for an average eight hours of operation.

f. *Notes, Column (6).* This column indicates informative notes keyed to data appearing in a preceding column.

B-5. Federal Supply Code for Manufacturers

| | |
|------------|-----------------|
| Code | Manufacturer |
| 23882 ---- | FWD Corporation |

Section II. BASIC ISSUE ITEMS

| (1) SMR code | (2) Federal stock number | (3) Description Ref. No. & mfr. code Usable on code | (4) Unit of issue | (5) Qty. inc. in unit pack | (6) Qty. inc. in unit | (7) Qty. furn with equip | (8) Qty. auth | (9) Illustration | |
|--------------------|--------------------------------|---|----------------------------|---|-----------------------------------|--------------------------------------|---------------------|---------------------|--------------------|
| | | | | | | | | (a) Fig. No. | (b) Item No. |
| PO | 7520-559-9618 | Grp 31—Basic Issue Items, Manufacturer Installed Grp 3100—Basic Issue Items, Manufacturer or Depot Installed CASE: Operations & Maint Publications, Cotton Duck, Water Repellant, Mildew Resistant ---- DEPARTMENT OF THE ARMY Technical Manual TM 5-3805-240-12 | -- | -- | 1 | 1 | 1 | | |
| PO | 7510-889-3494 | BINDER, LOOSE LEAF Equipment Log Book ----- | -- | -- | 1 | 1 | 1 | | |
| PO | 4210-270-4512 | EXTINGUISHER, FIRE ----- | -- | -- | 1 | 1 | 1 | | |
| PO | 2590-045-9611 | RIFLE CASE: W/Bracket ----- | -- | -- | 1 | 1 | 1 | | |
| PO | 4910-922-6921 | REPAIR KIT: Tubeless Tires ---- | -- | -- | 1 | 1 | 1 | | |
| PO | | SKEIN NUT WRENCH 23882 No. 758111 ----- | -- | -- | 1 | 1 | 1 | | |

Section III. MAINTENANCE AND OPERATING SUPPLIES

| (1) Component application | (2) Federal stock number | (3) Description | (4) Quantity required F/initial operation | (5) Quantity required F/8 hrs. operation | (6) Notes |
|--|--|--|---|--|---|
| ITEM 1 0101 CRANKCASE | 9150-256-9437 (2) 9150-265-9430 (2) 9150-242-9605 (2) | OIL, LUBRICATING: 55 gal drum as follows: OE 30 OE 10 OES | 21 qts 21 qts 21 qts | (3) (3) (3) | (1) Includes quantity of oil to fill engine oil system as follows: 20 qts—crankcase 1 qt —oil filter (2) See C9100-IL for additional data and requisitioning procedure. (3) See current LO for grade application and replenishment intervals. |
| ITEM 2 0306 TANK, FUEL | 9140-286-5297 (2) 9140-286-5289 (2) 9140-286-5285 (2) | DIESEL, FUEL: 55 gal drum as follows: DF-2 Regular Grade DF-1 Winter Grade DF-A Arctic grade | 100 gal(4) 100 gal(4) 100 gal(4) | (5) (5) (5) | (4) Tank capacity. (5) Average fuel consumption is 12 gal per hour of continuous operation at maximum governed speed. (6) Maximum protection is obtained at 60 percent by volume (4.8 pts of ethylene glycol per gal of solution). |
| ITEM 3 0501 RADIATOR | 6850-644-1409 6850-174-1806 | WATER ANTIFREEZE. 55 gal drum as follows: ANTIFREEZE: Ethylene Glycol ANTIFREEZE: Compound Arctic | 40 qts 40 qts | (6) (7) | (7) Do not dilute with water. Use full strength. (8) Use oil as prescribed in item 1. (9) Use oil as prescribed in item 6 above. |
| ITEM 4 0700 TRANSMISSION-TORQUE CONVERTER | | OIL, LUBRICATING (8) OE 10 OES | 35 qts 35 qts | (3) (3) | |
| ITEM 5 0800 TRANSFER CASE | 9150-265-9427 (2) 9150-265-9437 (2) | OIL, LUBRICATING: 55 gal drum as follows: OE 50 OE 30 | 14 qts 14 qts | (3) (3) | |
| ITEM 6 1000 and 1100 DIFFERENTIALS | 9150-577-5846 (2) 9150-577-5443 (2) | LUBRICATING OIL, GEAR: 55 gal drum as follows: GO 90 GOS | 18 qts ea 18 qts ea | (3) (3) | |
| ITEM 7 1003 and 1103 PLANETARIES | | LUBRICATING OIL, GEAR (9) GO 90 GOS | 2 qts ea 2 qts ea | (3) (3) | |
| ITEM 8 4308 HYDRAULIC TANK | 9150-265-9430 (2) | OIL, LUBRICATING: 55 gal drum as follows: OE 10 | 53 gal (4) | (3) | |

| (1) Component application | (2) Federal stock number | (3) Description | (4) Quantity required F/initial operation | (5) Quantity required F/8 hrs. operation | (6) Notes |
|--|--------------------------------|---|---|--|--------------|
| ITEM 9 7460 BUCKET DRIVE DIFFER- ENTIAL ITEM 10 GREASE POINTS | 9150-190-0907 (2) | LUBRICATING OIL, (6) GEAR GO 90 GOS GREASE, AUTOMOTIVE AND ARTILLERY: 35 lb pail as follows: GAA | 6 qts 6 qts 10 lbs | (3) (3) (3) | |

APPENDIX C

MAINTENANCE ALLOCATION CHART

Section I. INTRODUCTION

C-1. General

a. This section provides a general explanation of all maintenance and repair functions authorized at various maintenance levels.

b. Section II designates overall responsibility for the performance of maintenance functions on the identified end item or component. The implementation of the maintenance functions upon the end item or component will be consistent with the assigned maintenance functions.

c. Section III lists the special tools and test equipment required for each maintenance function as referenced from Section II (Not applicable).

d. Section IV contains supplemental instructions, explanatory notes and or illustrations required for a particular maintenance function.

C-2. Explanation of Columns in Section II

a. *Group Number, Column (1).* The functional group is a numerical group set up on a functional basis. The applicable functional grouping indexes (obtained from TB 750-93-1, Functional Grouping Codes) are listed on the MAC (Maintenance Allocation Chart) in the appropriate numerical sequence. These indexes are normally set up in accordance with their function and proximity to each other.

b. *Functional Group, Column (2).* This column contains a brief description of the components of each functional group.

c. *Maintenance Functions, Column (3).* This column lists the various maintenance functions (A through K) and indicates the lowest maintenance category authorized to perform these functions. The symbol designations for the various maintenance categories are as follows:

- C—Operator or crew
- O—Organizational maintenance
- F—Direct support maintenance
- H—General support maintenance
- D—Depot maintenance

The maintenance functions are defined as follows:

- A—Inspect. To determine serviceability of an item by comparing its physical, mechanical, and electrical characteristics with established standards.
- B—Test. To verify serviceability and to detect electrical or mechanical failure by use of test equipment.
- C—Service. To clean, to preserve, to charge, to paint, and to add fuel, lubricants, cooling agents, and air.
- D—Adjust. To rectify to the extent necessary to bring into proper operating range.
- E—Align. To adjust specified variable elements of an item to bring to optimum performance.
- F—Calibrate. To determine the corrections to be made in the readings of instruments or test equipment used in precise measurement. Consists of the comparisons of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared with the certified standard.
- G—Install. To set up for use in an operational environment such as an emplacement, site, or vehicle.
- H—Replace. To replace unserviceable items with serviceable assemblies, subassemblies, or parts.
- I—Repair. To restore an item to serviceable condition. This includes, but is not limited to, inspection, cleaning, preserving, adjusting, replacing, welding, riveting, and strengthening.
- J—Overhaul. To restore an item to a completely serviceable condition as prescribed by maintenance serviceability standards using the Inspect and Repair Only as Necessary (IROAN) technique.

K—Rebuild. To restore an item to a standard as nearly as possible to original or new condition in appearance, performance, and life expectancy. This is accomplished through complete disassembly of the item, inspection of all parts or components, repair or replacement of worn or unserviceable elements (items) using original manufacturing tolerances and specifications, and subsequent reassembly of the item.

d. *Tools and Equipment, Column (4)*. This column is provided for referencing by code the special tools and test equipment, (sec. III) required to perform the maintenance functions (sec. II).

e. *Remarks, Column (5)*. This column is provided for referencing by code the remarks (sec. IV) pertinent to the maintenance functions.

C-3. Explanation of Columns in Section III (Not Applicable)

a. *Reference Code*. This column consists of a number and letter separated by a dash. The num-

ber references the I and IE requirements column on the MAC. The letter represents the specific maintenance function the item is to be used with. The letter is representative of columns A through K on the MAC.

b. *Maintenance Category*. This column shows the lowest level of maintenance authorized to use the special tool or test equipment.

c. *Nomenclature*. This column lists the name or identification of the tool or test equipment.

d. *Tool Number*. This column lists the manufacturer's code and part number, or Federal stock number of tools and test equipment.

C-4. Explanation of Columns in Section IV

a. *Reference Code*. This column consists of two letters separated by a dash, both of which are references to Section II. The first letter references column 5 and the second letter references a maintenance function, column 3, A through K.

b. *Remarks*. This column lists information pertinent to the maintenance function being performed, as indicated on the MAC, section II.

Section II. MAINTENANCE ALLOCATION CHART

| (1) Group No. | (2) Functional group | (3) Maintenance functions | | | | | | | | | | | (4) Tools and equipment | (5) Remarks |
|------------------|---|------------------------------|------|---------|--------|-------|-----------|---------|---------|--------|----------|---------|----------------------------|----------------|
| | | A | B | C | D | E | F | G | H | I | J | K | | |
| | | Inspect | Test | Service | Adjust | Align | Calibrate | Install | Replace | Repair | Overhaul | Rebuild | | |
| 01 | ENGINE | | | | | | | | | | | | | |
| 0100 | Engine Assembly ----- | C | F | O | -- | -- | -- | -- | F | H | D | D | -- | A |
| 0101 | Crankcase, Block, Cyl Head ----- | -- | -- | -- | -- | -- | -- | -- | H | H | -- | D | | |
| | Cylinder sleeves, block ----- | -- | -- | -- | -- | -- | -- | -- | D | D | | | | |
| 0102 | Crankshaft | | | | | | | | | | | | | |
| | Bearings, main ----- | D | -- | -- | -- | -- | -- | -- | D | | | | | |
| | Crankshaft ----- | -- | -- | -- | -- | -- | -- | -- | D | -- | -- | D | -- | B |
| | Pulley ----- | O | -- | -- | -- | -- | -- | -- | H | | | | | |
| 0103 | Flywheel Assembly | | | | | | | | | | | | | |
| | Flywheel assembly ----- | -- | -- | -- | -- | -- | -- | -- | H | H | -- | -- | -- | C |
| | Housing ----- | -- | -- | -- | -- | -- | -- | -- | H | H | | | | |
| 0104 | Pistons, Connecting Rods | | | | | | | | | | | | | |
| | Piston rings, pins, retainers, bearings ----- | D | -- | -- | -- | -- | -- | -- | D | | | | | |
| | Rod, connecting ----- | -- | -- | -- | -- | -- | -- | -- | D | D | | | | |
| 0105 | Valves, Camshaft & Timing System | | | | | | | | | | | | | |
| | Rocker arms ----- | -- | -- | -- | F | -- | -- | -- | H | | | | | |
| | Cover ----- | O | -- | -- | -- | -- | -- | -- | O | | | | | |
| | Valves, springs, locks & guides ----- | H | -- | -- | -- | -- | -- | -- | H | H | -- | -- | -- | D |
| | Camshaft, bearings & timing gears ----- | D | -- | -- | -- | -- | -- | -- | D | | | | | |
| | Push rods ----- | H | -- | -- | -- | -- | -- | -- | H | | | | | |
| 0106 | Engine Lubricating System | | | | | | | | | | | | | |
| | Pump, oil ----- | -- | -- | -- | -- | -- | -- | -- | D | D | | | | |
| | Filter, oil; breather ----- | -- | -- | O | -- | -- | -- | -- | O | | -- | -- | -- | E |
| | Cooler, oil ----- | F | -- | -- | -- | -- | -- | -- | H | H | | | | |
| | Pan, oil, & gaskets ----- | O | -- | -- | -- | -- | -- | -- | H | H | | | | |

| Group No. | Functional group | Maintenance functions | | | | | | | | | | | Tools and equipment | Remarks |
|-----------|----------------------------------|-----------------------|------|---------|--------|-------|-----------|---------|---------|--------|----------|---------|---------------------|---------|
| | | A | B | C | D | E | F | G | H | I | J | K | | |
| | | Inspect | Test | Service | Adjust | Align | Calibrate | Install | Replace | Repair | Overhaul | Rebuild | | |
| 0108 | Manifolds | | | | | | | | | | | | | |
| | Exhaust manifolds | O | | | | | | | O | | | | | |
| 0109 | Accessory Drive Mechanism | | | | | | | | | | | | | |
| | Accessory drive | H | | | | | | | H | | | | | |
| | Pulley drive | O | | | | | | | F | | | | | |
| 03 | FUEL SYSTEM | | | | | | | | | | | | | |
| 0301 | Fuel injector | F | F | | F | | | | F | H | | | -- | G |
| 0302 | Fuel Pump | O | O | | | | | | F | H | | D | -- | F |
| 0304 | Air Cleaner | C | | O | | | | | O | | | | | |
| | Element | | | O | | | | | O | | | | | |
| 0305 | Blower, Assembly | | | | | | | | H | H | | D | | |
| 0306 | Tank Lines, Fittings, Headers | | | | | | | | | | | | | |
| | Fuel tank | C | | C | | | | | O | F | | | | |
| | Valve, lines, fittings | O | | | | | | | O | | | | | |
| 0308 | Engine Speed Governor | | O | | O | | | | F | H | | D | | |
| 0309 | Fuel Filters | O | | | | | | | O | | | | | |
| | Element | | | O | | | | | O | | | | | |
| 0311 | Engine Starting Aids | O | | C | | | | | O | | | | | |
| 0312 | Accelerator, Throttle | O | | | O | | | | O | O | | | | |
| 04 | EXHAUST SYSTEM | | | | | | | | | | | | | |
| 0401 | Muffler & Pipes | O | | | | | | | O | | | | | |
| 05 | COOLING SYSTEM | | | | | | | | | | | | | |
| 0501 | Radiator, Assembly | C | F | C | | | | | F | H | | | | |
| | Cap radiator | C | | | | | | | O | | | | | |
| 0502 | Shroud | O | | | | | | | O | | | | | |
| 0503 | Thermostat and Housing Gaskets | | | | | | | | | | | | | |
| | Clamps, hoses | C | | | | | | | O | | | | | |
| | Housings | O | | | | | | | O | | | | | |
| | Thermostats | O | | | | | | | O | | | | | |
| 0504 | Water Pump | | | | | | | | O | H | | -- | -- | G |
| 0505 | Fan Assembly | | | | | | | | | | | | | |
| | Belts | C | | | O | | | | O | | | | | |
| | Fan, cooling | O | | | | | | | F | | | | | |
| | Hub, assembly | | | | | | | | H | H | | | | |
| 06 | ELECTRICAL SYSTEM | | | | | | | | | | | | | |
| 0601 | Alternator-alternator Assembly | | O | | | | | | O | F | H | D | -- | F |
| | Belt, drive | C | | | C | | | | O | | | | | |
| 0602 | Regulator, Voltage | | O | | O | | | | O | | | | -- | F |
| 0603 | Starting Motor | | | | | | | | | | | | | |
| | Motor, starting | | O | | | | | | O | H | | D | -- | G |
| | Solenoid, motor starting | | O | | | | | | O | | | | | |
| 0606 | Engine Safety Controls | | | | | | | | | | | | | |
| | Safety switches | O | | | | | | | O | | | | | |
| 0607 | Instrument Panel | | | | | | | | | | | | | |
| | Gages, switches | C | | | | | | | O | | | | | |
| | Lamps, panel, lights | C | | | O | | | | O | | | | | |
| 0608 | Miscellaneous Items | | | | | | | | | | | | | |
| | Switches, fuses, slave | | | | | | | | | | | | | |
| | Receptacle | O | | | O | | | | O | | | | | |
| | Turn signal ay & Wiring harness | O | | | O | | | | O | | | | | |
| 0609 | Lights | | | | | | | | | | | | | |
| | Head, tail, & flood lights | C | | | | | | | O | | | | | |
| | Lamps | C | | | | | | | O | | | | | |
| 0610 | Sending Units & Warning Switches | O | | | | | | | O | | | | | |

| (1) Group No. | (2) Functional group | (3) Maintenance functions | | | | | | | | | | (4) Tools and equipment | (5) Remarks |
|------------------|--|------------------------------|------|---------|--------|-------|-----------|---------|---------|--------|----------|----------------------------|----------------|
| | | A | B | C | D | E | F | G | H | I | J | | |
| | | Inspect | Test | Service | Adjust | Align | Calibrate | Install | Replace | Repair | Overhaul | | |
| 0611 | Horn, Siren | | | | | | | | | | | | |
| | Horn, button & relay ----- | O | -- | -- | -- | -- | -- | -- | O | | | | |
| | Wiring ----- | -- | -- | -- | -- | -- | -- | -- | O | O | | | |
| 0612 | Batteries, Storage | | | | | | | | | | | | |
| | Batteries ----- | C | O | O | -- | -- | -- | -- | O | | | | |
| | Battery box; cables, battery ----- | C | -- | O | -- | -- | -- | -- | O | O | | | |
| 0613 | Hull or Chassis Wiring ----- | O | -- | -- | -- | -- | -- | -- | F | O | | | |
| 0615 | Radio Suppression ----- | O | O | -- | -- | -- | -- | -- | O | | | | |
| 07 | TRANSMISSION | | | | | | | | | | | | |
| 0708 | Torque Converter | | | | | | | | | | | | |
| | Torque converter ----- | C | -- | C | -- | -- | -- | -- | D | -- | -- | D | |
| | Hoses, pipes, fittings ----- | O | -- | -- | -- | -- | -- | -- | O | | | | |
| 0710 | Transmission Assembly | | | | | | | | | | | | |
| | Transmission assembly ----- | C | F | C | -- | -- | -- | -- | H | -- | -- | D | |
| | Breather ----- | -- | -- | O | -- | -- | -- | -- | O | | | | |
| | Levers & linkage ----- | -- | -- | -- | O | -- | -- | -- | O | | | | |
| 0721 | Coolers, Pumps, Motors | | | | | | | | | | | | |
| | Cooler, oil ----- | -- | -- | -- | -- | -- | -- | -- | H | H | | | |
| | Hose, pipes, fittings ----- | O | -- | -- | -- | -- | -- | -- | O | | | | |
| | Filter, transmission oil breather ----- | O | -- | O | -- | -- | -- | -- | O | | | | |
| | Screen assembly ----- | O | -- | O | -- | -- | -- | -- | O | | | | |
| 08 | TRANSFER ASSEMBLY | | | | | | | | | | | | |
| 0801 | Power Transfer Assembly ----- | O | -- | O | -- | -- | -- | -- | H | H | -- | D | |
| 09 | PROPELLER & PROPELLER SHAFTS | | | | | | | | | | | | |
| 0900 | Propeller Shafts, Universal Joints ----- | -- | -- | O | -- | -- | -- | -- | F | H | | | |
| 10 | FRONT AXLE | | | | | | | | | | | | |
| 1000 | Front Axle Assembly ----- | O | -- | O | -- | -- | -- | -- | H | H | -- | D | |
| | Breather ----- | O | -- | O | -- | -- | -- | -- | O | | | | |
| 1002 | Differential ----- | O | -- | O | -- | -- | -- | -- | H | -- | -- | D | |
| 1003 | Planetary or Final Drive ----- | O | -- | O | F | -- | -- | -- | H | -- | H | | |
| 1004 | Steering Mechanism ----- | -- | -- | O | O | -- | -- | -- | H | H | | | |
| 11 | REAR AXLE | | | | | | | | | | | | |
| 1100 | Rear Axle Assembly ----- | O | -- | O | -- | -- | -- | -- | H | H | -- | D | |
| | Breather ----- | O | -- | O | -- | -- | -- | -- | O | | | | |
| 1102 | Differential ----- | O | -- | O | -- | -- | -- | -- | H | -- | -- | D | |
| 1103 | Planetary or Final Drive ----- | O | -- | O | F | -- | -- | -- | H | -- | H | | |
| 12 | BRAKES | | | | | | | | | | | | |
| 1202 | Service Brakes ----- | O | -- | -- | O | -- | -- | -- | H | -- | H | | |
| 1206 | Mechanical Brake Controls | | | | | | | | | | | | |
| | Adjuster slack ----- | O | -- | O | O | -- | -- | -- | F | | | | |
| | Emergency parking | | | | | | | | | | | | |
| | Brake control ----- | O | -- | -- | -- | -- | -- | -- | O | | | | |
| 1208 | Air Brake System | | | | | | | | | | | | |
| | Chamber, valves ----- | O | -- | -- | O | -- | -- | -- | F | -- | H | | |
| | Filters, reservoir ----- | O | -- | -- | O | -- | -- | -- | F | | | | |
| | Hoses, lines & fittings, etc. ----- | O | -- | -- | -- | -- | -- | -- | O | | | | |
| 1209 | Air Compressor | | | | | | | | | | | | |
| | Compressor assembly ----- | O | -- | O | -- | -- | -- | -- | F | -- | H | | |
| | Governor assembly ----- | -- | -- | -- | O | -- | -- | -- | F | -- | H | | |
| 1211 | Trailer Brake Connections & Controls ----- | O | -- | -- | -- | -- | -- | -- | O | | | | |

[illegible]

| (1) Group No. | (2) Functional group | (3) Maintenance functions | | | | | | | | | | | (4) Tools and equipment | (5) Remarks |
|------------------|--------------------------------------|------------------------------|------|---------|--------|-------|-----------|---------|---------|--------|----------|---------|----------------------------|----------------|
| | | A | B | C | D | E | F | G | H | I | J | K | | |
| | | Inspect | Test | Service | Adjust | Align | Calibrate | Install | Replace | Repair | Overhaul | Rebuild | | |
| 5004 | Piston, Connecting Rods | | | | | | | | | | | | | |
| | Bearing, pins, pistons ----- | H | | | | | | | H | | | | | |
| | Retainers ----- | H | | | | | | | H | | | | | |
| | Rod assembly ----- | | | | | | | | H | H | | | | |
| 5005 | Valves | | | | | | | | | | | | | |
| | Retainers, springs, valves ----- | H | | | | | | | H | | | | | |
| 5006 | Lubricating System | | | | | | | | | | | | | |
| | Lines, fittings ----- | O | | | | | | | O | | | | | |
| 5007 | Compressor Drives | | | | | | | | | | | | | |
| | Belt ----- | C | | | C | | | | O | | | | | |
| | Pulley ----- | O | | | | | | | F | | | | | |
| 5008 | Air Intake | | | | | | | | | | | | | |
| | Intake, air ----- | | | | | | | | F | | | | | |
| 5009 | Unloader System Components | | | | | | | | | | | | | |
| | Air regulator ----- | | | | | | | | O | F | | | | |
| 5010 | Compressor Cooling | | | | | | | | | | | | | |
| | Fitting, Lines ----- | O | | | | | | | O | | | | | |
| 74 | EARTHMOVING EQUIPMENT COMPONENTS | | | | | | | | | | | | | |
| 7454 | Bucket Line Assembly ----- | O | | O | O | | | | F | F | H | | | |
| | Bucket ----- | O | | | | | | | O | | | | | |
| | Teeth ----- | O | | | | | | | O | | | | | |
| 7455 | Bucket Line Boom | | | | | | | | | | | | | |
| | Boom assembly ----- | O | | O | | | | | F | F | | | | |
| | Guards, chutes, plates & locks ----- | | | | | | | | O | O | | | | |
| | Shaft, foot ----- | | | | | | | | F | F | | | | |
| 7456 | Boom Headshaft ----- | O | | O | | | | | F | F | | | | |
| 7458 | Boom Push Arms ----- | | | O | | | | | F | F | | | | |
| 7460 | Bucket Line Drive ----- | | | O | O | | | | F | F | | | | |
| 7462 | Conveyor Discharge ----- | O | | O | O | O | | | F | F | H | | | |
| 7463 | Follow Up Scraper ----- | O | | O | | | | | O | O | | | | |
| 7464 | Boom Hoist Assembly ----- | O | | O | | | | | O | F | | | | |
| 76 | FIRE FIGHTING EQUIPMENT COMPONENTS | | | | | | | | | | | | | |
| 7603 | Fire Extinguishers ----- | O | | | | | | | O | | | | | |

Section III. SPECIAL TOOL AND SPECIAL TEST EQUIPMENT
REQUIREMENTS

| Reference code | Maintenance level | Nomenclature | Tool number |
|----------------|-------------------|----------------|-------------|
| | | None required. | |

Section IV. REMARKS

| Reference code | Remarks |
|-------------------|--|
| A—B | Test includes engine operation and compression |
| B—K | Metalize and grind |
| C—1 | Replace Ring Gear |
| D—1 | Reface Valves |
| E—C | Replace filter element |
| F—B | On equipment test |
| G—1 | Install repair kit |
| H—C | Included use of emergency tubeless tire repair kit |

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By Order of the Secretary of the Army:

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To be distributed in accordance with DA Form 12-25, Section II, (qty rqr block no. 390), Organizational Maintenance requirements for Earth Moving Equipment, Ditching Machine.

